
AN
E S S A Y
ON THE
PRACTICAL
HISTORY OF SHEEP
IN SPAIN, &c.

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AN
E S S A Y
ON THE
PRACTICAL
HISTORY OF SHEEP
IN SPAIN,
AND OF THE
SPANISH SHEEP
IN
SAXONY, ANHALT DESSAU, &c.

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LEIPSICK 1785.

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CHAPTER THE FIRST.

OF THE NUMBER OF SHEEP

IN SPAIN.

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ACCORDING to the most authentic accounts*, there are in Spain five millions of fine-wooled sheep. In the care of them are employed above 25,000 men, who roving about with them constantly, through hills and valleys, have pastures and roads in all parts of the kingdom, appropriated to themselves, and spend the summer-months, now in one, and now in another province, but (in winter†) always remain in the warmest. These flocks require likewise, 25,000 great dogs or more, each of which gets a daily allowance of two pounds of bread.

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Besides

* Hanoverian Magazine, III. 1765. p. 243. 246. Croma Europ. produkte, p. 41.

† The words (*in winter*) are wanting in the original, but the context and sense require them.

Besides these, there are many flocks of coarse wooled sheep, that are not driven about into fresh pastures.

The first sort are called by the Spaniards, *Merinas transumas Leonefis*. They naturally belong to the kingdom of *Leon* and to *Old Castile*, whence they are driven into *New Castile* and *Estremadura*. The second sort of *Merinas* are found about *la Serena*, but do not migrate. They are I am sure originally of the same breed as the first kind; but their wool, through bad summer feeding, has so declined, that the *Aroba* sells for 20 or 30 *réal de vellon* cheaper than the wool of the fine-fleeced sheep.

There are likewise in *Andalusia* sheep of a larger size than the last mentioned, and whose wool is still of a coarser kind.

Besides these there are in *New Castile*, *Andalusia*, and *Arragon*, many black sheep*, whose wool, when dressed, becomes of a dark brown colour, and serves for the cloathing of the peasantry.

A stock of sheep is called *cabanna*. The number in a *cabanna* varies: that of the Duke de Infantando, consists of 44,000 head, and that of the Marquis de Iranda, of 42,000. These were the largest, which the author of my manuscript

* *Hispania nigri velleris præcipuas habet—Lanarum nigrae nullum colorem bibunt.* Plin. Hist. Nat. l. viii. c. 48.

manuscript memoirs had seen. They are however seldom found to consist of less than 10,000 sheep.

IN SAXONY.

THE number of sheep in this country cannot be accurately determined; nor have I seen any printed documents relative to it.

According to a *tabelle* drawn up in the year 1779, by order of government, the Lower Palatinate contained 100,000* head of sheep, and if we may credit the petition presented to the Duke of Wirtemberg, by the office of inspection at *Urach*,† there are at present in the Dutchy of Wirtemberg 350,000†, whereof 100,000 are breeding ewes, from which they reckon on 100,000 lambs yearly.

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* Schloezer, in his Epistolary Correspondence, says, that only 78,787 sheep were returned according to the *tabelle*; but as each overseer usually keeps from 30 to 50 sheep more than the communities (who farm out the pasturage) have agreed to, the above calculation is probably right.

† Appendix to Mayer's Dissertations on the promoting of Domestic and Rural Economy. Frankf. 1783. p. 105.

† Roessig allows 400,000 sheep to the Dutchy of Wirtemberg.

IN ANHALT DESSAU.

THERE are here about 50,000 head, rather more than less. A smaller number indeed appears on the farm-contracts, but the reason of it is, that where, for instance, 600 are mentioned 1400 are fed. The inspectors regulate matters according to the situation, attendance, and pasturage, or sorts of fodder which they cultivate. The following list of flocks is according to the returns of the agents.

1.	The Prince's administration under the inspection of Counsellor Rode*.	Head.
		2,494
2.	Mr. Raumer, in Worlitz, - -	6,000
3.	Mr. Morgenstern, in Gandersleben, -	2,000
4.	Mr. Wahnschaff, in Great Altleben, -	3,000
5.	Mr. Holzhausen, in Groebzig, - -	1,416
6.	Mr. Bieler, in Fraasdorf, - -	2,000
7.	Mr. Bobbe, in Scheider, - -	1,500
8.	Mr. Brandt, in Reipzig, - -	1,200
9.	Mr. Braun, in Radegast, - -	800
10.	Mr. Coeler, in Mehringen, - -	1,500
11.	Mr. Gneist, in Werderhausen, - -	1,200
12.	Mr. Jasper, in Rosdorf, - -	2,000
13.	Mrs. Jasper, in Rehfen, - -	2,000
	14. Mr.	

* In the year 1780, Mr. Bieler had in the same place 5,315 head.

SHEEP.

5

Head.

14. Mr. Lipke, in Salzfurth,	-	-	1,000
15. Mr. Matte, in Liebedorf,	-	-	500
16. Mr. Northmann, in Poetniz,	-	-	3,000
17. Mr. Matte, in Retz,	-	-	1,000
18. Mr. Reiffner, in Frekleben,	-	-	1,500
19. Mr. Richter, in Klekewitz,	-	-	2,000
20. Mr. Meyer, in Great Badegast,	-	-	800
21. Mr. Happach, in Hoyerfdorf,	-	-	700
22. Mr. Northmann, in Schakenthal,	-	-	2,000
23. Mr. Sauberlich, in Windorf,	-	-	800
24. Mr. Sauberlich, in Dohndorf,	-	-	800
25. Mr. Jasper, in Sixdorf,	-	-	700
26. Mr. Behr, in Loberitz,	-	-	700
27. Mr. Bachman, in Coermicke,	-	-	500
28. Mr. Diener, in Little Kuhnau,	-	-	500
29. Mr. Kirchner, in Toerten,	-	-	3,000
30. Mr. Koch, in Mofikau,	-	-	300
31. The Prince's administration bought in June, 1783, from Mr. Ræfig,	-	-	431
32. The prince's flock at Oranienbanm,	-	-	6,000

Total, 53,331 head.

CHAP.

CHAPTER II.


OF THE SHEPHERDS*IN SPAIN.*


NOBODY is allowed to keep *Merinas transumas Leonefis*, or to drive them from one province into another, except those who have a privilege for so doing. A sheep-owner however can sell his privilege to another. The winter and summer pastures seldom belong to the sheep-owners, but are usually farmed from a convent, a village, or from the king. In the two first cases they are paid for in rent, and in the last by a tythe.

Every *cabanna* is under an overseer called the *majoral*, who usually lives in the village that is nearest to the *cabanna*, wherein he keeps the necessary stores of corn, flour, nets for penning the sheep, the skins of such as die, &c.

He has one, and sometimes two servants, who take care of his mules, and in his absence deliver
out

out bread to the shepherds, keep an account thereof, and ride out with him. He has likewise, when the stock is numerous, one or two bakers, to bake for the shepherds and dogs. The *majoral* purchases corn and other necessaries, and keeps an account of all receipts and expenditures.

A *cabanna* of about 40,000 sheep is divided into smaller flocks, from 1400 to 2000 each, called *rabannas*. Every *rabanna* is in the charge of an upper shepherd, who is styled *quarta-major*. He is appointed by the *majoral*, and it is his business to receive salt, nets, bells, stakes, hatchets, &c. as also bread for himself, his underlings and dogs, from the *majoral's* stores. He is responsible for the number of sheep consigned to him, and must inspect the cattle and their keepers, and vouch the death of any of his flock, by the return of the skins to the *majoral*, before whom at stated times he is to count his *rabanna*.

The *quarta-major* has under him three servants, or shepherds, who tend the sheep, watch them at night, and do every other necessary work. I do not know how much is the salary of a *majoral*, but that of a *quarta-major* is from 3 to 400 *réal de vellon* a year, which make of our money, from 20 to 27 *rix-dollars*. Besides this he can keep four mares, or more, as likewise goats for his own profit. In several *cabannas*

nas they are allowed to keep some sheep of their own, but in others not.

The *quarta-major* rarely goes on foot to his *majoral*, but rides on a horse of his own, which he loads at his return with a sack full of bread for himself, his shepherds and dogs.

A common shepherd's wages are 200 *réals* a year and sometimes more, with as much bread as he has occasion for.

Neither in summer while in *Leon*, nor in winter in *Estremadura*, do the shepherds or sheep live under what may be called a roof. The former live in round huts, made up of stones in their lower part to the height of two ells*, covered with rushes and grafs. In the middle of this hut (called in Spanish *chozo*) is the fire-place, and round it are wooden benches, on which the *quarta-major* and his shepherds sit and sleep. Near the hut are fixed the pennis or nets, within which the *rabanna* is penned at night, in three divisions. The dogs, whereof there are three, four, or even more to a *rabanna* of 1500 to 2000 sheep, lie at night, (be the weather as it will) round the fold to watch against the wolves.

The shepherd's huts and the pennis, or nets, are always placed on an eminence, so that the sheep may enjoy the morning sunshine until noon.

* About four feet and a half.

IN SAXONY AND DESSAU.

Gentlemen, who manage their own estates, or their stewards, have *master shepherds*, who mix a certain proportion of sheep of their own, with those belonging to the gentlemen, and have, according to agreement, an interest in the profit and loss of the whole flock, on which account they are called *mixed shepherds*.*

Professor Beckmann prefers this kind of shepherds to two others, namely the *farm shepherds* according to the custom of the Palatinate, and of Franconia and Pomerania, and the *hired shepherds*. There are however some inconveniencies attending them, especially when a gentleman, who has fine-wooled sheep, is obliged to deal with them. For the mixed shepherds generally keep coarse-wooled sheep for their own proportion, whence it follows, that the flock cannot but degenerate. The best way to prevent this evil is not to suffer them to put any ewes in the flock, but to pay the difference. As to the weathers it is of no consequence, whether they be coarse-wooled or not, as they are shorn but once and sold the same summer: but of this matter I shall treat more at large hereafter.

* Beckman's Principles of Rural Economy, 1775. p. 458.

The usual contract runs thus: the shepherd is appointed provider of the flock, that he shall serve his master faithfully, and do in all things his duty as his conscience shall direct, that he shall endeavour always to keep the flock in good condition, and be responsible that it shall not suffer any damage through his fault or that of his people or servants, and that he will comport himself on every occasion as becomes an honest and faithful *master shepherd*.

The salary of a master shepherd varies according to almost every district.

The great object to be attended to is, to blend his interest as closely as possible with that of the gentleman. In the country of Koeten the shepherd has the sixth sheep; in the principality Dessau about the seventh or eighth; and in the prince's royalty about the eighteenth. In the electorate of Hanover the shepherds and servants have mixed flocks. The former have the 15th and the latter the 20th sheep.

The master shepherd has also other advantages, which are usually as follows, viz. 81* bushels of rye, the same quantity of barley, 6 bushels of wheat, and 5 of peas, besides 18 of barley for fattening, 6 dollars a year for small beer, a cag of beer every holiday, 8 head of March sheep, and 21 cans of oil. Besides all this, he is allowed the feeding of 120 head of sheep, and in

* In the original *three wispel and nine scheffel*.

many places of two cows. On the other hand, all the dung belongs to the gentleman, and shepherd must employ his own servants to bring vetches and clover to the flock.

When a flock consists of between 5 and 6000 sheep, the master shepherd keeps 6 or 8 persons, whom he maintains; and each of whom is allowed the grazing of a certain number of sheep, so that the calculation of the mixed sheep stands in the following proportion.

The master shepherd 120 head; the weather tender 60; the first shepherd 60; the second do. 60; the yearling herd 60; the first lamb-herd 60; the second do. 50; the house servant 50; and the cow herd 45. Accordingly the gentleman must allow the feeding of 565 head free, with this condition however, that every thing be managed properly, and that the under-shepherds shall not feed more sheep in winter than the proportion agreed upon.

The upper bailiff Mr. Holzhausen last year put his three under-shepherds on a different footing. Instead of the feeding of 60 sheep he allows each of them 35 dollars wages; by which means all mistakes are prevented, and the fine-wooled sheep remain unmixed.

The master shepherd must buy and bring home, at his own expence, all the straw that is necessary. He is at liberty to hire the servants, but with the approbation of the gentleman.

He is not permitted to keep more than one sow and her litter, but must not suffer them to come among the sheep, as this can be allowed by the gentleman alone.* He has his own and the flock's habitation in buildings annexed to the sheep farm.

'Tis easy to perceive, that these are merely the words of a contract, which may be varied as men please. Such a contract usually holds from one Michaelmas to another, and three months warning, which each party is free to give, must precede its dissolution.

The master shepherd must answer with his property, of whatsoever kind it may be, for the damages sustained by fire, negligence, or other causes.†

* As sheep love cleanly food, I am surprized that any one would allow swine to wallow amongst them.

† The general frauds committed by the shepherds are, to keep more sheep in winter than the stipulated number; to buy cheap ones in spring, which they fatten in summer and sell to advantage in autumn; to close the lamb account early in the year, and keep to themselves such as fall afterwards; and to kill healthy sheep and reckon them among those, that die a natural death.

CHAPTER III.

OF SPRING, SUMMER, AND WINTER FEEDING,
IN SPAIN.

FROM January to June the sheep are driven to pasture, between nine and ten o'clock in the morning, but after a heavy fall of dew not until eleven. Then, the shepherd having let down part of the nets, and thereby opened a passage, calls out with a pipe, and by repeating the word *Toma*, the tame sheep (*Manfos*) which are usually weathers, come out: he now and then reaches them something to allure them. The whole flock follows the tame sheep, and the shepherd, having led them 50 or 60 paces from the penn, leaves them to themselves. The sheep return of their own accord towards the nets in the evening.

While the sheep are grazing, the dogs keep near them, and the shepherd follows at some distance, that, if they should go astray, he may bring them to the right path again.

The

The pasturage of a *rabanna* lies round about the habitation of its shepherds, and on its boundaries are the flock of a neighbouring *quarta-major*. The huts and nets of each *cabanna* are all within a certain compass, and where it ends another *cabanna* begins.

The Spaniards are exceedingly careful, not to drive out the sheep from January until the end of May or June, before the sun has dried up the dew, or till it has been washed off by rain.

They say the dew is so noxious in those months, that whole flocks might be destroyed by it, causing a most dangerous disorder called *Basquilla*.

Before they are driven out, the shepherds examine the whole flock, to see if any of them have symptoms of the scab, and anoint such as are affected.

While the sheep are out, the *quarta-major* rides to the *majoral's*, where he gets bread for himself, his men, and his dogs, ointment for the scab, and whatever else is necessary. Oil, vinegar, and red pepper he procures at his own expence.

The time, when these migrating sheep leave *Estremadura*, is usually from the 15th to the 25th of April. The *majoral* issues his orders to the *quarta-majors* concerning the manner of breaking up their quarters.

The whole flock, if of one kind, such as old sheep &c. are driven together, although, when grazing, they form three distinct divisions. Some
of

of them, particularly the tame weathers have large bells, with wooden clappers, hung about their necks, and then the whole *cabanna* begin their march.

The *quarta-major* goes before the flock, and the three shepherds with 6 or 8 dogs go on each side and behind. In this order they march, from one to three days together, the distance of seven Spanish leagues, each of which is a journey of an hour and a quarter, and sometimes of two hours. The journey is made chiefly through free or royal pastures, whereof there are some of considerable extent every where on the rout. On these the sheep graze, when the dew is dried up. It is the unanimous opinion of the *majorals*, that the flocks suffer considerably during this march, especially if the weather is very warm.

For their night encampment they choose if possible some place near a village, where the sheep are left unpenned; but they are watched by the shepherds and dogs, particularly where wolves are numerous.

They proceed thus without interruption in their journey, till they arrive in Old Castile or Leon, countries where they are indigenous. They pass the summer there until October, and then return to their winter quarters in *Estremadura*.

IN SAXONY AND DESSAU.

SOME persons, and indeed the most sensible, would wish, that all rights of common pasture were abolished. Others and alas! the greater number are tenacious of their old privileges. Before I engage in this dispute, which the strong arm of government alone can decide, I shall make some observations relative to the country.

In spring, before the new grafs is sprung up, the sheep eat *foul*. Before the end of March and sometimes of April, the weathers do not go out to pasture; there is nothing in the fields, sheep-walks, or meadows but what is hurtful, as they could get only old grafs. From April to St. Martin's day, the sheep are penned in the fields. In rainy weather, when the ground is water-soaked, they cannot thrive; they are sickly when exposed to all sorts of weather; even the dung in the pens is good for nothing. In lands of a sandy soil the sheep are less injured, but such soil is rare in this country. They can also sleep longer on dry sandy ground than on a hard soil soaked with water. And what shall I say of the glowing sun acting upon them? They pant, seek for shade under the slender enclosures of their pens, and hide their heads by instinct to shelter
as

as much of their bodies as possible from its rays. When there happen to be such hot summers, as we have had for three years past, the sheep run foul and the fattest of them die of a burning heat in the spleen.

This is a true picture of our sheep farming, and I have said nothing as yet of the winter. Should there be a fall of snow, they get nothing but straw, notwithstanding the old saying, *Worse food than straw, a sheep ne'er saw*. If it is frosty weather, they are let out on the frozen corn fields to the great detriment of tillage. What man, if he wishes to be a friend to his flocks, can leave any longer unremedied the innumerable sufferings, which this most useful species of animals is exposed to?

Stall-feeding and the cultivation of Clover would remove these evils.

Volumes have been written and published on this subject, some of which I shall mention at the bottom of the page.† Persons, who wish to be
D informed,

† Mayers's sixth continuation of dissertations on the promoting of Domestic and Rural Economy, 1771.

Leske, de agri novalis cultura et ratione pecudes in stabulis pascendi.

Three Memoirs by Counsellor Schubart, which are to be found in the Leipfick Magazine and among his economical works.

informed, will find in them truths as clear as the noon day.

The introducing of stall and penn-feeding, and the abolition of feeding on fallows in general, and on meadow-ground in spring, could in my opinion be effected in the following manner.

From the 16th of November until the middle of August, the sheep should be fed in stalls and pennis, but from August to the 18th of November they may feed on stubbles and after-grass.

Whereas for the stall and penn-feeding of nine months a considerable quantity of fodder is requisite, first of all it is necessary to inquire, how much fodder will be wanting in this case, and in what manner it should be cultivated. Artificial meadows of Spanish clover are the best and only means for providing the necessary fodder for such stall and penn-feeding; but the number of acres to be sown with Spanish clover cannot be accurately determined, as this depends upon the nature of the soil, and upon the weather, which has very particular influence on the crops of clover. 'Tis not however impossible to form an average calculation, supposing the soil to be tolerably good, and that the summer be not too dry.

In this supposition an acre of ground sown with one bushel of the *Weimar* measure could produce 50 cwt. of dry, or 250 cwt. of green clover.

Now

Now admitting, that every sheep consumes daily two pound of dry, or, which is the same thing, ten pound of green clover, 100 head of sheep would require per day two cwt. and per month 61 cwt. of dry clover, which could be produced from an acre and a quarter. In case therefore the sheep be fed for nine months, and that 61 cwt. be allowed monthly for 100 head, the whole of their fodder during that period would come to $518\frac{1}{2}$ cwt.

The landholder, who wishes to introduce this sort of fodder, should calculate, how many cwts. of hay grow on his natural meadows, and compare them, according to the aforesaid proportion, with the number of sheep which he intends to keep in winter, and make up the deficiency with Spanish clover, both green and dry, which can be cultivated in fallow ground.

In a farm, where the produce of the natural meadows was such, that the sheep could be fed with hay according to the given proportion from the 16th of November to the 16th of May, it would be very easy to introduce stall and penn-feeding, whereas in that case clover would be wanting but for three months, viz. from the 16th of May to the 16th of August; and, admitting the above calculation to be true, clover enough for 100 head of sheep could be cultivated in three acres and three quarters.

But, although this be true, yet it would be necessary to sow a certain greater proportion of ground, for example, one-fourth part more with clover, which fourth part should be mowed early in the year, and the clover saved. Without such a redundancy of fodder, it might happen, that the clover left for the sheep would flower all at once, in which case it would be too hard for them. On the contrary, when the clover not only on the fourth part already mentioned, but also on the whole field is cut down at an early season, the second growth will continue to supply the sheep with new clover. Such parts of the crop, as may have flowered, can be saved and used for winter feeding.

I recommend the following books to the farmer's perusal :

1. Directions to farmers for the amelioration of the breed of sheep, by Bergen, Berlin 1781.
2. Prodromus to the monthly Practico-economical Encyclopedia for German farmers, by John Riem, Dessau, 1783.
3. Monthly Practico-economical Encyclopedia, by the same, Lipsick, 1785.
4. Count de Bork's description of the Stargard farm in Lower Pomerania, Berlin, 1783.
5. Counsellor Schubart's Memoir on the cultivation of foddering herbs, in the second part of economical writings.

C H A P.

CHAPTER IV.

OF SALT,

IN SPAIN.

THE sheep, when in Old Castile and Leon, get salt two or three times a week in summer. It is given to them on flat stones prepared for that purpose.* For every hundred head of sheep, they reckon about three *vanegas* of salt, which are equal to two bushels and a quarter of Dresden measure. In winter, when in *Estremadura*, they give them no salt (except in the cabannas of the district of La Mancha) because they think that the grass and herbs in that country contain a sufficient quantity of salt and drying particles in themselves. On the contrary in *La Mancha*, where there is a scarcity of good herbs, the sheep
get

* Professor Sander of Carlruhe, whose untimely death was a loss to Natural History, says in his book on the Goodness and Wisdom of God in Nature, that the fine woolled sheep in Spain, when in their summer pastures, get as much salt as they wish for. A thousand sheep consume accordingly 2500 pounds of salt in five months.

get a certain allowance of salt, but still much less than when they are in *Castile and Leon*. The shepherds, who as well as their sheep are indigenous in the provinces of *Estremadura and Andalusia*, and accordingly do not tend the *Marinas transumas Leonefis*, never give salt to their flocks. The author of my manuscript *Memoirs* could not discover the reason of this practice, but it is probably owing to the parsimony of the owners of the flocks.

The usual time for giving them salt is the evening,* when they are driven into the pens; on the following day they are let to drink as much as they please at limpid streams and rivulets.

IN SAXONY.

According to the *Leipsick Gazette*,† the sheep at *Stolpen*, as long as they are housed, get salt every ten, twelve, or fourteen days; but in summer

* I have not yet seen or heard among our German economists, that salt is given in the evening, it being always given in the course of the day. Yet it is undeniably better to give it in the evening than in the morning or at noon; for the violent thirst has ceased from that time until the next day, and accordingly the sheep do not overfill their stomachs with water, which would render the salt pernicious.

† Of the year 1767. p. 139.

summer, when the weather is dry, it is given to them two or three times in the week.

As it is well known, says *Ræsig*,* how much the licking of salt meliorates the wool, the government prescribed the use of Polish rock-salt, both for the flocks belonging to the prince, and for those of the subjects. Experience has proved, particularly in Prussian Silesia, that rock-salt contributes wonderfully to the improving of the wool, much more so than common salt. At Stolpen 800 sheep got, according to the direction of Spanish shepherds during winter (from the first of January to the end of April) on fourteen different days, thirty pounds of clean pounded Polish rock-salt, but in summer (from the first of May to the last day of December) the same quantity every week. Instead of a cwt. of rock salt, they compute two bushels of common kitchen salt.

The advantage of giving salt to the sheep does not seem to be understood in many parts of Saxony, as in many places it is not used. If you ask the reason, they answer, that even in Spain there are several districts, where the sheep do not get salt, and that, when the pastures are neither too dry nor too wet, and the sheep feed well, they do not want a digestive condiment, and can do without it.†

In

* In his *Essay of a Practical History of Economy, Police, &c.* 1781—par. 1. pag. 244.

* Beckmann's *Principles of German Economy*—p. 454.

IN ANHALT DESSAU.

In this country falt is given, according as the overseers think proper.

The head bailiff Holzhausen has made several experiments relative to this matter. In the year 1782 he gave to 1193 head of sheep five pounds of falt,* together with dry clover, every day, during the month of May. In 1783, when he introduced penn-feeding in the fields, the flocks used to get falt twice a week, with green clover.

In December they were fed with steeped corn, and got every day three quarters of pease, Berlin measure, beside half a Berlin bushel of falt twice a week, which was dissolved in hot water, and then poured into the drinking places.

Since January 1784 he gives the ewes, besides falt, oil-cakes, viz. a whole one each day for every hundred. Sixty of such cakes cost two dollars and six gr. Experience will shew whether a certain writer be right, who disapproves of the use of these cakes; for according to him it makes the sheep's stomachs clammy.

In

* Leipfick Magazine, third part, 1783.

In the electorate of Hanover no salt is given, and in some other places it is given but once, or twice at most, in summer.

“ Salt, says an economical friend in a letter to
“ me, is a medicine for sheep in every country and
“ in every soil; but it must not be given, except
“ when their stomachs are foul, and they want
“ a digestive. It may therefore be given in Hano-
“ ver as well as in Saxony. After they have ta-
“ ken it, the shepherd must keep them from water
“ and wet pastures, lest they may be induced by
“ thirst to overfill their stomachs, whereby they
“ would suffer more, than what they had benefit-
“ ed by the taking of salt.

CHAPTER V.

OF SHEEP-SHEARING,

IN SPAIN.

As soon as the fine-wooled sheep (already described) are on their way towards *Leon* and *Old Castile*, preparations are made, if the weather is fair and not too cold, for shearing them.

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According

According to information received from several *majorals* of the Spanish *cabannas* all the sheep in Spain are shorn dry, it having been found, (as they assert) that the wool of sheep, which have been washed or bathed, suffers a great alteration and becomes coarser, and that such washing, especially if cold weather comes on shortly after, is very detrimental to the health of the sheep.

The dry shearing is used, not only in the *cabannas* of the *Merinas transumas Leonefis*, or of the migrating sheep, but likewise in *Estremadura* and *Andalusia*, where it is carried on, from the beginning until the middle of May, and regulated in the following manner.

The sheep, that are to be shorn, are driven on the preceding day, after having grazed a while, close together into a stall, made for the occasion, or into a *cural* (which is a circular place surrounded with a wall from two to two ells and a half high) for the purpose of bringing them into a *sweat*, whence two advantages are derived: first, by making the wool fall more readily to the ground it renders the shearing more easy, both to the shearers and the sheep; secondly it makes the wool look better, and gives it a lustre, which it never loses even by washing.

On the following day, those sheep are shorn and let out to feed, according as the shearing of each flock or parcel is finished; for they are not allowed to feed until after they are shorn, because
fed

fed sheep, in the act of shearing, are much more subject, than unfed ones, to a distemper, that might be the cause of their death.

But lest the number, that come last of all to be shorn on that day, should remain too long without food, the shearing begins early in the morning and ends about four in the afternoon.

In changeable weather they are better pleased to leave the sheep without food for thirty hours or more, than to bring them straight from pasture to be shorn.

Before the gate of the above mentioned stall nets are placed in the form of a parallelogram, the short side whereof is open towards the gate. The sheep are let into this space, and thence handed out by the attending shepherds to the shearers, all of whom do their work standing. In some *cabannas* the shearers are paid 6, 7, or $8\frac{1}{2}$ *quart* for every head of sheep. ($8\frac{1}{2}$ *quart* make a *réal de vellon*). In other *cabannas* they are paid by the day.

Every *majoral* has his own shearers, of whom there may be 300 or more, according to the largeness of the *cabanna*.

These shearing companies usually have a leader, whom they call *Capitan*. He agrees with the *majoral* for their wages, and attends along with him at the shearing, to prevent the cutting or wounding of the sheep, and helps to make up the fleeces.

If a sheep happens to be cut, they apply a kind of earth, called *morena*, to the wound, which looks like the earth of coal mines.

Should cold weather, as it sometimes happens, come on after the shearing, the sheep suffer by it. The shepherds however procure shelter for them (where stalls are not to be had) from the winds, in woods or near villages.

All the sheep both old and young are shorn in the month of May.

A part of the wool of the *Merinas transumas Leonesis* is sent *unwashed* to London and Amsterdam, in which places it is sold by commissaries.

Another part likewise *unwashed* is sold to the king's cloth-manufactories, and some of it is washed at the expence of the proprietors of the sheep.

For some years past in the cabanna of the *Marquis of Irlanda* they wash the wool together, and then send it to London. In this operation the following process is observed.

The greatest part of the *Merinas transumas Leonesis*, (when, about the latter end of April, they are on their way from Estremadura back to their summer quarters in old Castile and Leon,) are shorn in the territory of *Segovia*, *Soria*, and the neighbouring districts, where there are also to be had the necessary conveniencies for washing.

Soon after the shearing is over, and before the washing begins, the wool is sorted, which is done by

by an intelligent man appointed for that purpose. It is divided into four different sorts, the first of which is the wool of the breast and shoulders-blades, back, and hips. The second sort is that of the sides, neck, and head. The third is that of the belly; and the fourth that of the legs, or in general, the wool that grows on the hindmost parts, and which has been so soiled in the shearing, that it cannot be washed clean. After the wool has been sorted, it is delivered to the washer. There are several washing places, in each of which is a fire-place, with plenty of hot water, in three or four large pans. Near to it is a large boiler set in mason's work, into which is put as much wool as it can hold, each sort by itself, and warm water poured upon it. The degree of heat is such, that the washer can keep his hands in it. Then, being stript almost naked, he washes and squeezes the wool with his hands, until the dirt of it is at least softened.

Near the large boiler is a channel likewise of mason's work about 20 or 30 ells long and $1\frac{1}{2}$ wide, unconnected with the boiler, in which is kept a constant run of clear cold water. Into it they throw the wool, after it has been sufficiently washed in the warm water. Four or five men, or more, are stationed along the channel, who take the wool as it floats, and draw it up and down several times. The last of them takes the wool out, and lays it on a clean place prepared for that purpose,

pose. In this manner a great quantity of wool can be cleaned in one day.

The drying requires still greater attention, as the wool owes its lustre principally to this operation. The drying-place must be kept very neat, and have, if possible, a clean stone-pavement. It should be situated towards the south or north; for the easterly winds diminish the lustre and good appearance of the wool, whereby it makes a worse figure for sale.

When well dried it is made up in bales, and sent off, chiefly from Bilbao, to London and Amsterdam. *

The Bales of the first and finest sort are marked R. F.
which stands for *Re fino*.

The second sort F. that is, *Fino*.

The third — S. that is, *Secundo*.

The fourth — T. that is, *Terzero*.

They are also marked with the name of the proprietor of the *cabanna*, whence the wool comes, and with that of the person who has sorted it, as the estimation of the wool depends in a great measure upon the names of such persons being marked upon it.

Some

The price per Aroba is of No. 1 or R. F. 280 real de vellon,

— Of the second sort. 240 Réal.

— Of the third — 200 R.

— Of the fourth — 160 R.

SHEEP.

Some years ago, the sheep used to be rubbed with red oker six months previous to the shearing season; it was supposed to contribute to the growth of the wool. This has been found to be not only a groundless supposition, but the wool buyers (particularly those of London) have protested against it, as it prevents the wool from ever attaining a proper degree of whiteness.

IN SAXONY AND DESSAU.

The shearing of such sheep, as are shorn but once a year, takes place about St. John's day; but, when they are to be shorn twice a year, the first shearing is about St. Werburgh's, and the second about St. Bartholomew's day. The first is called the *spring-shearing*, and the second the *harvest-shearing*. The sheep are first driven into the water, so as to be overhead in it. This is repeated two or three times. If after this forced bathing cold weather comes on, as it often happens in the beginning of May, it is easy to conceive, that the sheep suffer considerably, and that some of them die in consequence. Would it not be better either to shear them but once a year, or not to wash them before the shearing, especially as they are much afraid of the water, and go into it with

with great reluctance*? At *Stolpe* the sheep were not driven into the water before shearing, and, according to directions given by some Spanish shepherds, the wool was washed with lukewarm water.

The shearer does not tie the sheep, but holds them between his legs, and seldom cuts or wounds them. One man can shear in a day 60, 80, and if he is very attentive to his work, even 100 head. His wages are but two *pfennige* (German pence) a head. Of the quantity of wool and the price of it per stone I shall treat in another place.

CHAPTER VI.

OF THE PECULIARITIES OF SHEEP IN DIFFERENT COUNTRIES.

The *Polish* or *Silesian* sheep have fine wool, long legs, the body small, the neck long, the nose and back elevated, and the head quite smooth as far back, as behind the ears. They have very little wool under the belly; their legs are quite bare, and, what is very remarkable, they are apt in winter to lose their wool, not only from under the belly, but likewise from their backs.

This

* Leipzig Gazette, p. 139.

This falling off of the wool is owing merely to a sort of sickness, occasioned by bad foddering, after they had been used to better fare: for if they get good fodder so as to recover, nature throws off the decayed wool, that was checked in its growth. But, if they constantly get good fodder, and the wool be in growth, nothing of this kind takes place.

The ewes are more apt to lose their wool than the wethers, which have only their own bodies to nourish.

The Spanish sheep are not so high on their legs, but are fuller in the body, and short-necked; the nose and back are rather depressed than elevated; their legs are covered with wool to the very heels, as is also the head up to the eyes. The wool of the belly, neck, and back is all of one length and thickness, and, what is best of all, they are not apt to lose their wool in winter. Nature has also provided them with horns.

I pass over the *indigenous* sheep of Saxony and *Dessau*, as there are but few of them remaining, and no intelligent person would like to hear of small sheep with long goats-hair, that costs one dollar, 18 gr. per stone. Whoever wishes to see the old breed of *Dessau* may go there himself.

CHAPTER VII.

OF BUYING SHEEP,

IN SAXONY.

FROM the foregoing description it appears, what choice should be made in the buying of sheep.

In the year 1765 the King of Spain made a present of some rams to the Elector of Saxony, which were brought to *Stolpen*. 'Tis not necessary to give an account here of the great care, that was taken of them, as it is amply described in the *Gazette* of the year 1767, p. 139, and in *Borowsky's Almanack of German rural economy* for the year 1783, p. 343, as likewise in *Roessig's* essay of a practical history, 1781. p. 244.

The sheep-cote at *Hohenstein* under the direction of Mr. Koenig was established in the year 1768, and was, as far as I know, the second of the Spanish kind.

Borowsky tells us, that the Spanish breed was spread from the electoral lands to the sheep-cotes of several private persons.

In

In the year 1778 there was for sale, on the estate of Droeschkau not far from Belgern on the Elbe, a Spanish flock of two *four-toothed* rams, 80 ewes, and 80 wethers.

In the same year 1778 Mr. Vogeln was sent for the last time from Saxony to Spain, where he bought 100 rams and 200 ewes, each of which cost 15 dollars or, as others say, 40 dollars.

Not only *Saxony* has improved its flocks, but likewise the King of Prussia, to whom economics are so much indebted, has endeavoured to meliorate his flocks by means of Spanish sheep.

At Frankenhäusen in the Palatinate, there is an excellent breed improved by Spanish rams.

In Austria 300 Spanish sheep have been distributed in places, that were thought to be the fittest for encouraging the breed.

The Empress Queen has established at Merco-pail*, on the Caroline road, a nursery of *Spanish* and *Padua* sheep, from which persons of landed property get some good sheep gratis.

Whoever wishes to read the history of the French, Spanish, English, and Flemish flocks, may consult Carlier, *Traité des bêtes à laine, ou, methode d'élever, et de gouverner les troupeaux aux champs et à la Bergerie*, either the large work of the year 1770, or the small one in duodecimo of 1769.

* Instructions for the best manner of managing Sheep, &c. Ulm, 1776.

M. Carlier impressed with the idea of the many and great benefits arising from sheep says with Melon, *Le pain est de premiere, et la laine de seconde necessité.* The reader will see from the same work, that France reaped no particular advantage from the sheep brought from Spain and England, because they had been placed in tracts not fit for them, and confined in stalls, for fear they might fall sick and die.

The Flemish sheep are the largest of all; their length is five feet, and they weigh up to 180lb.

The sheep called *Turkish* sheep, under which are comprehended those of *Moldavia, Wallachia, Macedonia &c.* yield (according to the manual of instructions for the Austrian overseers of sheep by Wiegand, Vienna 1775) plenty of long and tolerably fine wool, which however is unfit for making fine cloth.

Mr. Wiegand had once a considerable flock of *African* sheep, but did not keep them, as their wool was too hairy for the clothiers.

The *Padua* sheep are not all equally good, wherefore it is necessary to make choice of the fine-wooled ones. Even in Spain there are coarse-wooled *hairy* sheep. An intelligent nobleman, who had an estate in Hanover, gave orders twice for sheep from Spain. The first time he got two fine-fleeced rams, one of which died, and the other was too old; but the second time he got none but mere coarse-wooled ones.

In Lorrain there are several kinds of sheep, one of which is called *grande allemande*, and is originally of Hanoverian breed.

An agent, who had travelled a good deal for agricultural purposes, and had examined every thing with the eye of a connoisseur, told me, that at *Stadel* and *Gestendorf* near *Lebe* in the territory of *Bremen*, there were kept some *Eiderstadt* sheep, for the sake of their milk and flesh. Their wool is not coarse, but it is very thin. I apprehend, that whoever would mix *Eiderstadt* rams with his sheep, would lose in the weight of the wool, while, at the same time, the flock would be not much improved by them.

Those sheep used to feed on very rich pastures, and during the winter got the best March hay; then followed milk, large and fat lambs and wethers. But still the pastures and hay of that country are by no means equal to the good sheepwalks of *Deffau*. The sheep however on the pastures there do not eat foul, as is often the case in *Deffau*.

I have never seen any Swiss sheep; and, although I had never under my hands any of the before-mentioned *Eiderstadt* sheep, yet I have a better knowledge of them. Generally speaking, the *Eiderstadt* sheep eat and drink foul as well as the Hanoverian, Spanish, or any other kind of sheep (even goats are not free from it) when they are obliged to use the same fodder and drink with a flock,

flock, that gets warm. But left to themselves they avoid bad drink and food.

Seven years ago an experiment was made at *Giebichenstein* near Halle with 20 ewes and some rams. The rams were allowed to go out among the common sheep. Great care was taken of them; but on rich pastures they ate foul, and on the poor ones they were famished, as they could not nibble the grafs as the indigenous sheep do.

Mr. Veltheim at the same time made an experiment at *Osterau* with some sheep and rams, of which he had 30 head between old and young. They did not indeed eat foul; but, as they did not get sufficient nourishment in proportion to their size, and were starving in the hot season before the harvest, they became phthifical, and their lungs grew hard and ulcerous. Accordingly, when they were put afterwards on stubble ground, they did not thrive; some of them died, the rest were sold, nor are there any of them at present at *Giebechenstein* or *Osterau*.

Should even any further attempts be made in places fitter for the purpose than those last mentioned, that kind of sheep would not grow so large, nor be of so much advantage as they are near the north sea, and on the rich pastures along the *Wefer*. Supposing them to be fed in a given place, so that a pair of wethers could sell for 7 or 8 dollars, yet after from 1600 to 2000 head had been fed there, it would be difficult to feed the same number

ber in that place again. Admitting, that 400 weathers and sheep are brought to market, the profit of 400 dollars, which may be made by them, is not at all to be compared with that, which a flock can produce in fine wool, and where there is only one sort of expence.

I have been the more diffuse on this subject, as I had to do with a man, whose dissertation obtained a premium from the academy of Göttingen. He says, that the shepherds are very backward in what concerns the breed of sheep, and that they should renew it by buying *Holstein* or *Eiderstadt* sheep, of which he says he saw one killed, that weighed 120lb. and had 18lb. of suet, and 12 of wool. But the example of Swiss cows from all parts of Switzerland (except the canton of Berne and the country about *Marieneinsidel*)* should serve us for a lesson in this matter, wherever according to the size of cattle the pastures and foddering cannot be sufficiently improved.

IN ANHALT DESSAU.

Formerly there was a most wretched breed of sheep in this country, but Prince Leopold, about 50 years ago, meliorated his flocks by means of
Polish

* Romani, Agricultural Tour, second part, 1776, p. 212.

Polish and *Silesian* rams. This breed remains there still to the great advantage of the country.

As all innovations meet with opposition, it happened so to the prince, so that he was obliged to punish some shepherds severely, who let the rams grow foul and starve to death. By making them pay a heavy fine for every foul and enfeebled ram, matters were at last set right, and at present the sheep-cotes along the Elbe from Dessau to Wittenberg are in a most flourishing condition.

Mr. Brenkenhof is well known in the principality of Dessau. His improvements with *English*, *Turkish*, and *Macedonian* rams are related by Rœssig, p. 263 and in his life written by Meisner.

The head bailiff Holzhausen, who has received the double spirit of Brenkenhof, has some Spanish rams since the year 1780, by which he has got, in this present year, the fourth generation.

Observations in buying Sheep.

I entirely disapprove of the buying of Spanish ewes, for by doing so two sorts of wool are introduced into the sheep-cote, one fine, and the other still finer. Nor are the expences paid by it, as each kind must be shorn separately. Besides, it is natural for sheep, when brought from
a foreign

a foreign country and obliged to make use of fodder, that they were not accustomed to, to be subject to fevers, or to the scab.

I still more disapprove of the buying of such rams as are cheap indeed, but not right good. The best kind ought to be procured, without regarding the difference of the price.

Nor do I recommend the buying of rams born in Spain, that are not yet used to the climate of Germany. For besides that they cost 9, 10, or 11 dollars a head, and that it is difficult to get them out of Saxony,* they are taken such care of in the Electoral sheep-cote, and enjoy such excellent pastures, that, when removed thence, they are apt to be injured by the change of fodder.

It would be better in my opinion to procure rams from some of the private sheep-cotes of Saxony, in which the breed has been brought to such perfection, that there is scarce any discernible difference between the native Spanish wool and that of these improved flocks. Those rams used to be sold for 4 or $3\frac{1}{2}$ dollars each, but at present they sell for five.

These flocks consist of clean sheep, that are shorn once a year. Such rams, as go astray, become foul on account of the change of fodder, but they, as well as the rest of the flock, can be cured with ointments and washing.

G

If

* It requires much management and the assistance of good friends to bring Spanish rams out of Saxony. The precautions used in this matter are of great advantage to that country.

If the sheep-cote is to be meliorated merely with the help of *Hispano-German* rams, it would require more time to have wool of a superior quality, than if the sheep-cote were provided at the same time with ewes of the same breed; but then the danger is not near so great; the lambs feel no change, being born in the country and as it were indigenous, and better care can be taken of a few rams, both as to cleanliness and foddering, than of a whole flock.

New rams should be bought about every third year, none of which must be of the breed of those, that had been bought before.

CHAPTER VIII.

OBJECTIONS.

WHAT has been said hitherto, proves sufficiently the advantage of introducing the Spanish breed of sheep, but there are shepherds and farmers, who, blinded by their prejudices, make several objections to this plan. 1. That fine wool is not heavy. 2. That we have not as good pastures, as there are in other places. 3. That

3. That accordingly the wool falls off. 4. That the fineness of the wool is owing not to the breed, but to the pasture. 5. That it does not continue of the same quality, but degenerates again. 6. That fine-fleeced sheep are more subject to the scab. 7. And must be fed better.

Before I answer these objections, I shall insert here a letter written by a steward to his master, together with the answer to the difficulties proposed in it.

THE STEWARD'S LETTER.

I have spoken with the shepherd concerning the contents of the Essay sent to me; his objections are,

FIRST,

That there was a difference in the pastures, whereas in Saxony (the Spanish rams were to be brought from Saxony) there were dry and mostly field pastures; that sheep were used there to licking salt, and that accordingly it could and ought to be given to them; but that, on the contrary, our pastures are damp, and therefore the sheep should not get salt, which however is necessary for Spanish sheep; that from giving them salt there was danger of their eating foul, a thing which does not happen in Saxony; that sheep are not

subject to the scab in Saxony, whereas with us it is quite the reverse; and that the Spanish breed cannot be well washed and salved, when they get the scab, as their wool lies so loose upon them, that it falls off by washing and rubbing.

SECOND,

That the sheep and rams, which had been procured from W. degenerated here; that their breed yielded the worst mutton of any in the flock; and that they lost their wool.

THIRD,

That, if the Spanish breed is to be introduced, they must be shorn twice a year, as otherwise not one fourth part of the wool can be turned to advantage; and

FOURTH,

That others have sold their wethers for two florins a head, a price, which is often given here for old sheep. He also believes, that, were the profits of the Spanish flocks to be calculated, ours with German sheep are greater.

As to the shepherd's observations, No. 3, relative to shearing, I beg leave to remark, that, if the sheep were to be shorn twice a year, it would be a loss to the ground, whereas the sheep are in harvest-time of great use to the fields on account of their dung, which use they could not be of, were they to be shorn twice.

L. STEWARD.

A N S W E R.

I.

I have read the observations of the steward and shepherd, and perceive, that the shepherd is a prejudiced and ignorant man. He judges according to hearsay, does not understand the difference between clean and greasy sheep, and knows nothing about the Spanish, Polish, Silesian, or Saxon breed, or of the use of salt, or why it is given. If the sheep, that they have at present, live without medicine, and have an inclination for feeding, so might the fine-wooled sheep live without salt. It is true, that, when salt is given in the day time, some of the sheep drink too much, whence it follows that they are apt to eat foul; but, when it is given in the evening, it cannot injure them.

I will not deny, that the fine-fleeced sheep are more subject to the scab, than those, whose wool is very coarse. As long however as the fine-wooled sheep are out grazing, and lie in pens, there is very little difference. This proceeds partly from the vermin, which can lurk better in thick than in loose wool, and partly from the circumstance, that perspiration is more apt to be stopt in fine-wooled sheep, on account of the fineness of their pores, a circumstance, to which close stalls contribute their share. A shepherd must take
care

care lest the scab take root, for, if it forms a hard scruff, both coarse and fine wool are gone.

II.

That the experiment already made has not turned out well with regard to the wool, I will believe, in compliment to the shepherd. But as to their flesh, the fault is certainly owing to their state of health, which the shepherd has not taken care of. Our shepherds, instead of preventing the distempers, which foreign sheep are subject to, through the change of climate and feeding, by care and good fodder, neglect them, starve them, and let them grow foul, so that it is no wonder if their flesh is spoiled. Then it is said that they degenerate. Let people punish the shepherds as the great Prince Leopold did, and the sheep will thrive very well. As to the sheep losing their wool, it shews that they were of Polish and Silesian breed. I have assigned elsewhere the cause of the wool falling off.

III.

I do not think it necessary to have two shearings, when the sheep yield fine wool. However if that must be done, there is no harm in it. The object in keeping and feeding sheep is profit, which is unquestionably greater from fine-wooled sheep, whether once or twice shorn. But if one shearing will do, so much the better.

The

IV.

The value of the wethers and sheep, and what is made by butter and cheese, is not taken here into consideration. The steward and shepherd do not let us know, whether the wethers, when sold, are lean or fit for killing, or if they are sold immediately after being shorn; nor do they tell us how much the mutton costs a pound. Unfortunately this country and many other places do not afford pastures and fodder enough for rearing sheep fit for killing, or wethers that yield suet. The milk should be left for the lambs, and but very little of it made into butter. But where there is plenty of pasture and fodder, things go on in *Saxony*, just as they do in other countries. Besides the profits on butter and cheese, wethers sell for 2, $2\frac{1}{4}$, and $2\frac{1}{2}$ dollars.

At present no sheep from other countries are allowed to be killed in the Prussian dominions, on which account wethers sold last summer for one dollar, 8 g. a head. In Prince Leopold's time, Prussia was not shut against Dessau. Should this prohibition be removed, wethers would sell at a very different price.

There can be reared every where fine-wooled wethers as strong-limbed, and as fat as coarse-wooled ones, and the sheep will yield the same quantity of milk and cheese. The formation of the limbs and the quantity of milk depend upon nourishment.

Experience

Experience will make the shepherd and steward alter their opinion. They have seen as yet no other sheep but *German* ones, and are therefore excusable, when they reason ill upon the subject. If Spanish sheep are kept as clean and taken as much care of, as the sheep they have at present, I am sure the shepherd will soon acknowledge his error. Let him not make the least alteration, let him keep the fine-wooled sheep from bad food, as he does the others, and not mind salt, as it is not absolutely necessary. In cleansing them, care must be taken to rub them with little or no pitch at all. Nothing, but running water or washing, should be used for that purpose. Pitch cannot be got out of fine thick wool as well as out of coarse wool.

I hope I have sufficiently answered the proposed objections. I shall now shew the possibility of reducing my plan to practice, and adduce the example of a man highly deserving of agriculture and sheep-breeding.

On a certain estate there was in the year 1750, as coarse long-hairy wool as in any part of *Anhalt*, or to be found in *Bernburg*, and in the *Anhalt* districts near the *Saale*.

Fine wool was not to be found in *Anhalt*, except in the principality of *Dessau*, and that only from *Pattin* to *Wittenberg*. To improve the
coarse

coarse wool, was thought neither possible nor advantageous. Fine wool is no original produce of *Deffau*, but was first introduced there by the fine rams and sheep, that Prince Leopold procured.

Although this was well known, yet the melioration of wool was looked upon as not possible, in any part of Anhalt, except in *Deffau* alone. The reason assigned for this opinion was, that they had not as good grass and pastures as were to be found in *Deffau*, and that, as the goodness of milk depends upon fodder, so does the hardness and softness of wool depend upon the pastures. But, when I conversed with them upon the wretched state of our sheep-cotes, and expressed my idea of improving the wool, they answered, that it would not do, and that I would lose my pains. Admitting even, that I should introduce the best fine-wooled sheep, they said, that they would degenerate in a few years time, and yield as coarse wool as the indigenous ones; that for their own part they would not undertake any such thing; they did not wish for *silk-worms*; that fine sheep yield a smaller quantity of wool, are of a weaker constitution, and cannot bear as much hardship as the coarse-wooled sheep; that the breed of horses can be improved by intermixture, but not so that of sheep, and that the toughness of our grass is the cause of our wool being so hard and coarse.

Notwithstanding all this, as I was convinced not only of the possibility, but also of the certainty of

meliorating the wool, I set about it in despite of every opposition, and bought such rams as I wanted at *Wærlitz*, *Oranienbaum*, and *Pættnitz*, in which places the best wool was to be found at that time.

I got the rams I had before, and the shepherd's rams removed, and would not suffer any ram-lambs to remain in the flock, for fear of my being imposed upon.

In the year 1754 I began to send out the new rams among the sheep. I continued from eight to eight years procuring fresh rams, and in the year 1760 was enabled to sell my wool at a much better price than my neighbours. I also enjoyed the satisfaction to see, that several persons, who had looked upon the improvement of wool as useless, and even some of those, who had run it down as a wild scheme, followed my example, and procured rams from the places above mentioned.

After three or four years, the shepherd himself acknowledged, that the fine-wooled sheep yielded for the most part the same weight of wool, as the indigenous coarse-haired ones.

The having changed the shepherd brought me into an error, as I took from the new one some common sheep, and mixed them with the flock, which was already somewhat improved, whereby I got again wool of an inferior sort. It cost me a great deal of trouble to root out the coarse sheep; I was obliged to sell what I would not have sold otherwise,

wife. The last mentioned shepherd having died, I purchased from his widow her sixth part of the flock, and took into my employment the shepherd I have at present, with this condition, that he should sell off his own sheep, and pay me a certain price for those, that I had bought from the widow. On his parting with me he must leave all the sheep in the fold, but will be allowed for his share the value already determined.

It is almost necessary to put the shepherd upon this footing. The one, that I discharged, could not get employment afterwards on account of his having a finer sort of sheep, as some people would not mix theirs with his. I had bought the rams without the shepherd's concurrence and now enjoy the whole benefit of them myself. I allow none of the servants, who tend the flock, to let a ram-lamb go away, or to sell any of them.

The shepherd I have at present had coarse-wooled sheep before, but finds now by experience, that the better the wool the greater the profit.

The opposition, which I met with from the shepherds, I have experienced also from the neighbouring farmers; but I had afterwards the satisfaction to see, that several of them bought ram-lambs from me, and that others of them have changed their opinion.

From the year 1763 to 1769 I had as good and as fine wool, as that of Oranienbaum, Worlitz,

&c. from whence I had procured my rams. But in the following years from 1770 to 1772, as they were wet years, my whole stock died.*

There was no getting good fine-wooled sheep, and therefore I was obliged to take such as could be had. I took care however to avoid the worst kind, and bought sheep, principally in *Dessau*, from private persons, which indeed did not yield wool by any means to be compared with that of *Oranienbaum*, although it was better than that of the rest of Anhalt.

Since the year 1775, I have, by means of *Spanish* rams, brought this flock to its present state of perfection.

As the fine and short summer-wool does not generally meet with good purchasers, for these two years past, instead of shearing the *scabby sheep*† twice, I get them shorn but once, which contributes more to their health in case of cold and damp harvest-weather setting in, and brings more profit, whereas short summer-wool must be sold considerably cheaper than winter-wool can be disposed of.‡

winter

* If stall feeding and the cultivation of clover had been introduced, not one sheep would have been lost.

† *Schmiervieh* in the original, that is, sheep, which require salving or anointing. Tr.

‡ I cannot vouch for it, that short summer-wool is considerably cheaper,

Wool of one shearing bears a better price, than that of two shearings, be the shearing in winter or summer, as it can be used by stuff-manufacturers and hosiers, while the other sort is fit only for clothiers.

On my introducing the Spanish breed, some of the objections already proposed were urged again. Some economists blamed me, particularly for letting the scabby sheep of two shearings be treated like the sheep of one shearing ; it was said, they would lose their wool, and that the scab could not be rooted out.

In lower Saxony there are scabby sheep, and mostly of one shearing, which do not lose their wool ; nor does the scab affect them much, if proper care is taken of them.

The result of my method has been equally favourable ; the sheep have neither lost their wool, nor suffered more by the scab than they used, when they were shorn twice.

The most respectable dealers in wool at Leip-sick have found the greasy wool of one shearings as good, as that of the clean Saxon sheep ; for in curing the scab no pitch is used, but only tobacco and other ingredients, which can be washed out of the wool.

CHAPTER IX.

OF THE IMPROVING OF WOOL.

It will perhaps be not displeasing to the reader, if I draw out a scheme of the manner of improving the wool of a flock by means of Spanish rams, which will be intelligible to the meanest capacity: some accidents and abortions are unavoidable.

I suppose there are on a farm 400 breeding ewes. They give 400 lambs, half male and half female.

EPOCH A.

1. Four hundred ewes coupling with Spanish rams at Michaelmas 1784, give, at Easter 1785, two hundred ewe-lambs, which in harvest 1786 will have two teeth, and in harvest 1787 four teeth.

2. Four hundred ewes coupling at Michaelmas 1785 give 200 lambs* at Easter 1786, which in harvest 1787 will have two teeth, and in harvest 1788 four.

3. Four

* The lambs mentioned here, and in the sequel, are supposed to be females.

3. Four hundred ewes coupling at Michaelmas 1786, give 200 lambs at Easter 1787, which in harvest 1788 will have two teeth, and in harvest 1789 four teeth.,

4. Coupling at Michaelmas 1787,
 200 ewes of the old breed,
 200 ewes of Spanish breed of the first
 generation,
 will give 100 lambs of the first generation,
 100 lambs of the second do.—which
 at Michaelmas 1789 will have two teeth,
 and at Michaelmas 1790 four teeth.

EPOCH B.

5. At Michaelmas 1788, new rams are let out, and all the ewes of the old breed must be removed; otherwise, the first generation would be intermixed with the second, and the sameness of the wool would continue for a much longer time. In case of necessity, the best and strongest two-toothed sheep of the generation of Easter 1786 might be let out.

Then it stands thus :

200 Spanish six-toothed ewes—first generation,

200 Spanish four-toothed ewes—first generation,

give 200 lambs at Easter 1789—second generation—which at Michaelmas 1790 will have two teeth, and at Michaelmas 1791 four.

6. At

6. At Michaelmas 1789 coupling,
 200 Spanish six-toothed ewes—first genera-
 tion,
 200 Spanish four-toothed ewes—first genera-
 tion,
-

give 200 lambs at Easter 1790—second genera-
 tion—which at Michaelmas 1791
 will have two teeth, and at Michael-
 mas 1792 four.

7. At Michaelmas 1791 coupling,
 200 Spanish six-toothed ewes—first genera-
 tion,
 100 Spanish four-toothed ewes—first gene-
 ration,
 100 Spanish four-toothed ewes—second ge-
 neration,
-

give 150 lambs—second generation, and
 50 lambs—third generation, at Easter
 1791, which will have at Michaelmas
 1792 two teeth, and at Michaelmas
 1793 four teeth.

8. At Michaelmas 1791 coupling,
 100 Spanish six-toothed ewes—first genera-
 tion,
 100 Do. Do—second generation,
 100 Spanish four-toothed ewes—second ge-
 neration,
-

give

give 50 Lambs—second generation,
 100 Lambs—third generation, at Easter
 1792, which will have at Michaelmas
 1793 two teeth, and at Michaelmas
 1794 four teeth.

EPOCH C.

9. At Michaelmas 1792 new rams are let out,
 and all the ewes of the first operation must be re-
 moved, at least those, that partake more of the
 nature of their dams, than of their sires, and then
 we shall have

200 fix-toothed Spanish ewes—se-
 cond generation,
 200 four-toothed, Do.

which give 100 Lambs—third generation, at
 Easter 1793, which will have
 at Michaelmas 1794 two teeth,
 Do. 1795 four Do.

10. At Michaelmas 1793 coupling,
 200 fix-toothed sheep—second generation,
 150 four-toothed, Do.
 50 four-toothed sheep—third generation,

give 175 Lambs—3d generation } at Easter 1794,
 25 Lambs—4th Do. }
 which will have at Michaelmas 1795
 two teeth, and at Michaelmas 1796
 four teeth.

11. At Michaelmas 1794 coupling,
 150 fix-toothed sheep—second generation,
 50 Do. third generation,
 50 four-toothed sheep—second generation,
 150 Do. third generation,
-

give 100 Lambs—3d generation } at Easter 1795
 100 Lambs—4th Do. }
 which will have at Michaelmas 1796
 two teeth, and at Michaelmas 1797
 four teeth.

12. At Michaelmas 1795 coupling,
 50 fix-toothed sheep—second generation,
 150 Do. third generation,
 200 four-toothed sheep—third generation,
-

give 25 Lambs—3d generation } at Easter 1796
 175 Lambs—4th generation }
 which will have at Michaelmas 1797
 two teeth, and at Michaelmas 1798
 four teeth.

At Michaelmas 1796 the ewes of the second generation fall off, and the wool of the whole flock is as good, as that of the breed the rams belong to, or at least there is no remarkable difference. If one wishes to hasten the third generation, he may let the two-toothed ewes copulate; but such ewes are thereby checked in their growth, and bring forth small lambs, which in their turn beget smaller ones. In this manner the whole flock might diminish in size, a circumstance, which
 by

by people, who did not understand the cause of it, would be attributed to the having introduced rams of a foreign breed.

On the contrary, the melioration of the wool is retarded, when the ewes are let out in the fourth year. *Erxleben* says, that ewes could be let out at the age of two years, but that it would be much better to wait until the fifth year, as then they give remarkably large and excellent lambs, and can be used afterwards for breed as long as they live, although it would be better to stop, when they are eight years old. All this is very good but not economical enough, and few people will wish to reduce it to practice.

That no rams of the first and second generation should be allowed to couple with ewes, is easily understood.

According to rule, the rams should not be let to ewes of their own begetting, nor should they remain in the flock more than three years. But if one half of the ewes of the first generation are let out, for the first time, in the fourth year, in such case the rams can be used still for that time. In the fifth year no ewes, but those of the first generation, are used for breed; new rams must be then procured, as likewise in the ninth year, when all the ewes of the second generation are let out.

The anonymous author of the instructions for managing sheep according to the regulations of

the nursery established at *Mercopail* by the Empress Queen, agrees with me. He says: "The ewes must be coupled three times with good rams. The male offspring for the two first times must (as being as yet unfit for breed) be either castrated or killed, but the rams of the third begetting may serve for the purpose of propagation. The ewe-lambs are to be let out in due time to good Spanish rams, which must be changed constantly." What he says afterwards is true, only in a certain sense. "The whole flock is improved in eight years time." It would be better to say, in six years time, where the sheep were originally of a good kind; but nine years are requisite, when three generations are to be gone through.

Therefore rams should have been bought at Michaelmas 1784, Michaelmas 1788, and Michaelmas 1792; but the young rams of the fourth generation of Easter 1794, 1795, and 1796 will be fit for breed.

I shall now shew in another manner, how much time is required for the melioration of wool. Let us suppose the common sheep to stand to the Spanish breed, as 0 to 1: in this case it will appear, that the flock will not be intirely improved until the ninth year, although, even then, several coarse-wooled sheep will be found.

o Common

o Common breed,

1 Spanish breed,

$\frac{1}{2}$ First generation.

- - - - -

$\frac{1}{2}$ Breeding ewes, first generation,

1 Spanish rams,

$1\frac{1}{2}$ $\frac{3}{4}$ Second generation or half improved
sheep in the 3d year.

- - - - -

$\frac{3}{4}$ Second generation,

1 Spanish Rams,

$1\frac{3}{4}$ $\frac{7}{8}$ Third generation, or almost improved
sheep in the 6th year.

- - - - -

$\frac{7}{8}$ Third generation,

1 Spanish rams.

$1\frac{7}{8}$ $\frac{15}{16}$ Fourth generation in the ninth year, or
quite improved sheep equal to the
original Spanish breed.

On the contrary, when the Spanish rams are not constantly changed, it stands thus :

o Common sheep,

1 Spanish rams,

$\frac{1}{2}$ First generation.

- - - - -

o Common sheep,

$\frac{1}{2}$ Spanish rams,

$\frac{1}{4}$ Second generation.

- - - - -

o Common sheep,

$\frac{1}{4}$ Spanish rams,

$\frac{1}{8}$ Third generation.

- - - - -

o Common sheep,

$\frac{1}{8}$ Spanish rams,

$\frac{1}{16}$ Fourth generation.

Supposing that the copulation is made unalterably with Spanish rams, of as different a breed, as possible, from the ewes, that they are coupled with, in that case the lamb, that falls, is called a *Blindling* (Blendling).

From

From *Blindlings* come half-improved sheep. But, as we said already, new rams must be used ; otherwise the *Blindlings* would copulate with their fathers, and the object in view would be frustrated. The half-improved ewes bring forth, in the same hypothesis, quite improved sheep.

The breed is now formed, and is as perfect as it can be, considering the climate and soil. Until this epoch I did not put any of the new-born rams to ewes, as I would admit none of them for that purpose, except those of the third generation, which had been begotten themselves by original good rams.

My plan was undertaken in the following manner. Eighteen years ago I got from Spain two rams and two ewes of right good breed. They had been long on sea and were in a poor way, when they arrived here. Meanwhile I acquired some genuine good lambs of both sexes ; the greatest part of the old ones did not live long. The rams and ewes had marks in their ears indicating their breed, a precaution, which is used also at present for the purpose of discriminating one family from another.

I did not proceed far with this first establishment, and I wished for an opportunity of forming a third family. I procured eighteen rams from Spain, but they turned out to be of the kind, that are used there for slaughter, and had long hair like that of dogs or goats. They were not fit

fit for breed. The most of them died a natural death, and some of them were killed.

In the mean time the friend, who had procured them for me, died. However I got afterwards two new rams. One of them died, and the other was the founder of the third family.

A mortality among the lambs deprived me of them, and (as the father was by this time become unserviceable) of the whole tribe, together with a considerable part of the growth of the other two families, which to my great misfortune are the only ones I have at present.

Considering what has been said hitherto, it is not to be wondered at, that the improvement of my flock has been so slow, although more attention was paid to it, than is paid in any part of Saxony.

I have read and examined whatever has been written in different languages on the improving of sheep, and I have adopted what I thought to be best. Fortunately I have a good shepherd, on whom I can depend. In the rutting time each family is kept separate, which indeed causes some expence, but is absolutely necessary.

My young ones are let out to breed at the age of two years and a half, so that they are three years old at the falling of their first lambs. Many other things are observed, which it would be too tedious to relate. My sheep are never quite scabby, and are washed, when necessary, only with an infusion of tobacco.

Were

Were I to give my opinion on the execution of the preceding plan, I should say that, as 18 years have been already spent in improving, and six years are still requisite for further improvement, some great mistakes must have been committed.

Probably at first, only two or three rams were procured, the bad ones were kept, and afterwards rams of one breed were used; or through the changing of shepherds, coarse-wooled sheep have been mixed again with the finer kind, so that the flock yields both coarse and fine wool. Should the sheep be smaller than before, the cause of it is probably this, that the fine young ewes were admitted to the rams sooner, than they ought to have been, for the purpose of hastening the melioration of the flock.

CHAPTER X.

OF RAMS,

IN SPAIN.

THE rams are let out about the latter end of June, and the lambing season is in December.

In all the *cabannas* one sees the generating rams with their horns knocked off. They say, that this contributes to their health like bleeding, and that it cools, in some measure, their redundant and lustful blood. But it is not only in the first year, that they are to be let out to ewes, that their horns are struck off (about the middle of April,) at which time they are three years and three or four months old; but likewise, in the following years, some small part of the horns is struck off again, that they may bleed anew, and lose their redundancy of blood.

For this purpose they place a wooden block in the ground, near which they make a hole, where-
in

in the ram can lye on his back : his head is put upon the block, and he is kept fast by a shepherd. The horn is then struck off in two or three blows with a sharp instrument. In this operation, which is performed in the forenoon, before the rams have fed, it happens sometimes that they die, in consequence of their bleeding too much.

It was supposed, that the rams without horns or *polled* rams yielded finer, but not as much wool, as those with large and strong horns. In the different *cabannas*, from which were got the hundred rams purchased for Saxony in the year 1778, there were several polled rams, which in general had coarser wool than the horned ones. On that account none of them were bought. The *majorals*, that were consulted on the subject, agreed, that there is no difference between the wool of the one kind and that of the other. Some of them observed, that the horned rams are better and of a warmer constitution, than the polled ones.

They allow six rams for every hundred ewes. Three only are let out at a time, and continue so for three weeks, after which they are removed, and then the other three rams are let out likewise for three weeks.

When the generating rams are two years and two months old, they are separated, in the month of April, from the other rams, and kept in a place by themselves. But they are not put to

ewes until the following year, when they are three years and six months old, after their horns have been struck off in April, which operation the old rams also undergo again, if they are to be let out to ewes in the same year.

IN SAXONY AND ANHALT-DESSAU.

The rams are let out in the middle, or in the latter end of October, and the lambing season is in March. Our indigenous German sheep used to have no great inclination for coupling; but since the introduction of the Spanish breed, the rutting season comes on sooner. If the rams were not kept back, the lambs would fall earlier than there would be food for them.

At Grœbzic indeed, where they have stall-feeding and clover, the lambs fall in the beginning of January.

There are prejudices with regard to the management of flocks in Spain as well as in this country, for instance, the cruel practice of striking off the rams horns. That practice is not followed here; the rams retain their horns, beget lambs, and remain healthy, although, at the time of coupling, they ought to have as much blood here as in Spain, whereas about Michael-

mas

mas they have excellent feeding in the stubble-fields, which affords as much nourishment as the best grafs in Spain.

Some of them are at times very impetuous, leap over the pennis, and, as they are used to feed alone, do not mind the German sheep. It was greatly apprehended at first, that they would not feed on pastures of short and dry grafs, as it was supposed, that they always looked for long grafs and deep ground. If this opinion had been well founded, the deep pastures would have been, in wet weather, a cause of their feeding foul, which indeed, notwithstanding all the attention of the shepherds, is sometimes unavoidable.

It is very singular, that our common sheep are exceedingly afraid of the Spanish horned breed. At first it is all terror and confusion, and, although they remain quiet at night in the pennis, yet as soon as day appears away they run, and the men are for hours in quest of them to bring them together again. If this aversion continued, it would be much against propagation, but love at last surmounts every obstacle.

Erxleben is of opinion,* that one ram would be sufficient for about 20 ewes. It is said in the account of the nursery at *Mercopail*, that 30 ewes are allowed for one ram; but that number is too small, for one ram could do for 40 or 50 head.
I would

* Introduction to the Veterinarian Art, 1769. pag. 170.

I would not advise the keeping of more rams than are necessary ; for if there are too many of them, they fight, and act wantonly with the ewes, when they are not sufficiently employed, and, instead of furthering the breed, they check it.

It contributes very much to keep the rams strong, to give them a handful of oats every morning in Spring. It is given to them in one or two places near the penn, whither they are brought by one of the men, but after two or three days they come for it themselves.

At *Count Vizthum's* sheep-cote at *Wælke*, young rams are sold for three dollars and a half, but the old ones cost five. The wool is very good, but they are too small ; and size is an object worthy of consideration.

CHAPTER XI.

OF LAMBS,

IN SPAIN.

THE lambing-season falls, as has been said already, in December, that is, about a month or six weeks after the flocks have returned to *Estremadura*. There is no particular fodder provided for the sheep before the lambing, as is usual in Germany, there being neither hay nor any other substitute, but both the sheep and lambs are obliged to feed upon what they can get on the pastures.

At the dropping, the shepherds, except some little necessary assistance, leave it all to nature, and neither cleanse the wool nor milk the ewes, but leave the first milk to the lambs, as a sort of medicine. As no snow falls in *Estremadura*, the lambs can follow their dams in eight days after they are dropped, and soon become accustomed to grass.

In

In April, the tails of the lambs of both sexes are cut off, and at the same time the few males, which are to be used as guides or tame sheep, are castrated. The reason for cutting off their tails is, to prevent, in case of diarrhoëas, too much filth and dung from sticking to them.

When the whole flock both old and young are shorn in May, at the latter end of the month the lambs are separated from the old sheep, and placed among the ram-yearlings, or among the ewe-yearlings. When they are a year old, they are called *Los Borros de un anno*, and when two, *Los Borros de dos annos*.

Only a few of the males are castrated, as I said before, and as to the rest, such of them, as are not used for generation, are sold in the fourth or fifth year to the butchers.

IN SAXONY AND DESSAU.

The lambs fall in March, but with Mr. *Holzhausen* they fall in January. On the day that I am writing these lines, February the 10th, he has 200 lambs alive and well. The first of them fell on the 5th of January, the second on the 7th. On the following Sunday three lambs fell, and then from day to day four, six, and ten.

The

The wether-lamb, that fell on the 5 of January, has been already castrated. In this place they think it better to mutilate them, when they are a month old, than, as some would have it, at the age of three months or a year.

CHAPTER XII.

OF THE PROFITS OF A COARSE-WOOLED FLOCK,
AND OF AN IMPROVED ONE.

FIRST PART.

THE PROFITS OF A COARSE WOOLED FLOCK.

FROM St. John's day, 1779, to the same day,
1780, there were shorn in a sheep-cote in Hano-
ver,

492	Wethers,
574	Sheep,
334	Yearlings,

Total 1400, which yielded (the stone at
eleven pounds)*—387 stone, 8lb.
of wool, which at one dollar
and 34 marien-groschen† per
stone,

		<i>dol.</i>	<i>gr.</i>	<i>pf.</i>
	brought in	703	: 26	: 0
345	Wethers fold	- -	739	: 10 : 4
50	Sheep, Do.	- -	70	: 0 : 0

* In Hanover 16 ounces make a pound, and 114 lb. make
the cwt. Tr.

† In that country the dollar is equal to 36 marien-grof-
chen, and a mariengrosch or, as it is often called, a grosch is
equal to 8 pfennige. But they have another kind of groschen,
which they call guten (good) groschen. Twenty-four of these
make a dollar. Tr.

SHEEP.

75

	<i>d.</i>	<i>g.</i>	<i>pf.</i>
Killed for house-keeping . . .	22	33	0
Sheep and lamb-skins . . .	35	20	0

Sum total .	1571	17	4
Bought 230 wethers .	471	4	6

There remain . 1100 : 12 : 6

Of which the 12th part was for
the shepherd;

Cheese and milk, besides 4 cwt. }
and 36 lb. of butter . 62 : 17 : 6

From St. John's day, 1780, to the same day, 1781,
there were shorn,

391 Wethers,
692 Sheep,
470 Yearlings,

Total 1553, — yielded 475 ft. and
3 lb. of wool, which at

	<i>d.</i>	<i>g.</i>	<i>pf.</i>
one dollar and 21 gr. per stone, made . . .	702	6	4
Sold 341 wethers . . .	804	6	5
Do. 144 sheep . . .	149	6	3
Killed for house-keeping .	27	0	0
Sheep-skins . . .	30	5	3

Sum total .	1712	24	7
Bought 244 wethers . . .	415	12	0

There remain . 1297 : 12 : 7

Of which the 12th part was for the
shepherd;

Cheese and milk, besides 4 cwt. and
10 lb. of butter, . . . 93 : 1 : 2

From St. John's day, 1781, to the same
day, 1782, were shorn,
415 wethers,
467 sheep,
808 yearlings,

Total 1690 — yielded 460 ft. 5 lb.

of wool, which at one
dollar and 21 gr. per ft.

made	686 : 12 : 6
Sold 350 wethers, . . .	624 : 5 : 7
Do. 103 sheep, . . .	90 : 18 : 6
Killed for house-keeping, . . .	25 : 0 : 0
Sheep-skins,	15 : 0 : 0

Sum total 1441 : 1 : 3

Bought 212 wethers, . . . 335 : 27 : 1

There remain, . . . 1109 : 10 : 2

Cheese and milk, besides 1 cwt. and

68 lb. of butter, : : . . 31 : 6 : 0

SECOND PART.

THE PROFITS OF AN IMPROVED FLOCK.

To make the matter more clear, I distinguish three
species of sheep.

1. The coarse common sheep of Anhalt.
2. The breed of Dessau, originally Silesian.
3. The Spanish breed.

For the purpose of comparing them together with
greater precision, I shall reduce the two shearings, that
used to take place in one year, to one shearing.

Now

Now to begin with the common sheep of Anhalt, between St. John's day 1750, and 1751, were shorn,

Lambs 206

Old sheep in harvest . . . 398

Old sheep in spring . . . 495

Total, counting them by the	}	. . .	1099
two shearings . . .			

But considered as if shorn but once . . . 550

They yielded (the stone of 22 lb.) 71 ft. 13 lb. of wool, which being sold at 2 dollars 6 gr. per stone, brought in 150 dollars, 10 gr. Therefore 100 head of sheep yielded 13 stone of wool, value about $27\frac{1}{3}$ dollars.



Between St. John's day, 1752, and 1753, were shorn,

Lambs 141

Old sheep in harvest 413

Old sheep in spring 497

Total, counting them by the two shearings	1051
---	------

But considered as if shorn but once . . . 526

They yielded 69 ft. 10 lb. of wool, which, being sold at two dollars and a half, and 2 dollars 10 gr. per stone, brought in 170 dol. 8 gr.

Therefore 100 head yielded 13 ft. 2 lb. of wool, value about $32\frac{1}{2}$ dollars.

2. The Deffau breed, originally Silesian.

Between St. John's day, 1766, and 1767, were shorn,

Lambs	.	.	.	.	.	172
Old sheep in harvest	.	.	.	.	.	530
Old sheep in spring	.	.	.	.	.	590

Total, counting them by the two shearings 1292

But confidered as if shorn but once . 646

They yielded 69 stone of wool, which were sold for five dollars per stone, and brought in 345 dollars.

Therefore 100 head yielded 11 ft. 3 lb. of wool, value 53½ dollars,



Between St. John's day, 1767, and 1768, were shorn,

Lambs	.	.	.	.	.	182
Old sheep in harvest	.	.	.	.	.	495
Old sheep in spring	.	.	.	.	.	545

Total, counting them by the two shearings 1220

But confidered as if shorn but once , 610

They yielded 51 ft. 3 lb. of wool. which, sold at 5 dollars per stone, made 256 dollars.

Therefore 100 head yielded about 8½ stone of wool, value about 42½ dollars.

3. Sheep

3. Sheep of Spanish breed, together with the shepherd's mixture.

Between St. John's day, 1781, and 1782, were shorn,

Lambs	.	.	.	.	.	231
Old sheep in harvest	.	.	.	.	.	584
Old sheep in spring	.	.	.	.	.	662

Total, counting them by the two shearings 1477

But considered as if shorn but once . 738

They yielded 80 $\frac{1}{2}$ stone of wool, which, sold at 8 dol. 6 gr. per stone, made 664 dollars.

Therefore 100 head yielded 10 ft. 20 lb. of wool, value about 90 dollars.

Between St. John's day, 1782, and 1783, the whole flock was shorn but once - 796 head.

They yielded 78 ft. 14 lb. of wool, which, sold at 11 dollars per stone, made 865 dollars.

Therefore 100 head yielded 9 ft. 10 lb. of wool, value about 108 $\frac{1}{2}$ dollars.

From the foregoing calculation it appears,

1. That the coarse common sheep yielded between the years 1750 and 1753 the greatest quantity of wool, viz. 13 stone for every 100 head.

2. That the Deffau or Silesian breed in a year, when grafs and winter-fodder were scarce, yielded

ed only $8\frac{1}{2}$ stone for every hundred head, but in a common year of fodder and grafs they yielded eleven stone.

3. That the Spanish sheep, when shorn twice, yielded, notwithstanding their being of a finer breed, as much wool, as the Deffau or Silesian sheep, viz. eleven stone for every 100 head.

4. That, on the contrary, the Spanish sheep, when shorn but once, yielded only about 10 stone for every 100 head. It is true indeed, that this diminution in the weight of the wool was owing in some measure to the early and long winter of 1782 and 1783; but still we must allow, that the wool, which grows after shearing, is of a more vigorous growth, than when it has attained a certain length.

5. That, when the Spanish sheep can get, the whole year round, strong nourishing fodder of red clover &c. they may be shorn twice and will in that case yield more, than if shorn but once: but, if the fodder be bad and they be treated sparingly, they will not yield much even in two shearings.

With regard to the weight of the coarse wool from 1750 to 1753, I must remark, that those were plentiful years, and that the flock at that period was not as numerous as afterwards, so that the sheep received more nourishment, and accordingly could yield more wool. But, admitting even that the coarse common sheep would
yield

yield more wool with the same quantity of fodder and pasture, than the Silesian or Spanish breed, yet still they produce much less profit.

The coarse wool is still at its old price of two dollars and a half per stone.

The Dessau or Silesian wool, which in 1767 and 1768 was sold for five or six dollars per stone, is somewhat dearer at present, and sells at seven or seven dollars and a half.

If the wool of our flock were of the same sort, and as good as that produced in Dessau, 100 head of sheep would, according to the present high price of wool, bring in annually from 77 to 80 dollars; but, on the contrary, the Spanish wool brings in actually $108\frac{2}{3}$ dollars for every 100 head.

In three or four years time, continuing to improve the flock, the wool, which sells at present for eleven dollars per stone, will be brought up to the price of 14 or 15 dollars, as it is in Saxony.

The *quality* of wool is a natural property of the various sorts of sheep, and cannot be improved by feeding, but merely by the intermixture of other breeds.

The *quantity* of wool and the largeness of the sheep, depend upon good or bad feeding. Therefore it is wrong to form a comparison, with regard to the quantity of the wool, between two different places, where the pasture and fodder are not the same. To know which breed of sheep yields most wool, the experiment should be made in one

and the same place, where different breeds were kept with the same fodder and pasture.

Although thinking men may approve of the preceding calculations and remarks, yet some persons might think them too prolix, or might wish that I had not included the lambs wool. I shall therefore make an abstract of the wool from 1752 to 1755, and from 1779 to 1781, as also of the money received, omitting the lambs wool.

One hundred head of sheep in two shearings, from St. John's day 1752 to 1753, yielded

Wool—15 stone, 2 lb.
Money received—37 dollars.

From 1753 to 1754,
Wool—14 stone 21 lb.
Money received—37 dol. 2 gr.

From 1754 to 1755,
Wool—12 stone 19 lb.
Money received—34 dol. 4 gr.

From 1779 to 1780,
Wool—11 stone 10 lb.
Money received—69 dollars.

From 1780 to 1781,
Wool—11 stone 10½ lb.
Money received—69 dollars.

The

The coarse sheep yielded more wool from 1752 to 1755, than the fine ones from 1779 to 1781. But the summers of these two last years were extraordinary dry, whereas the years from 1752 to 1755 were plentiful, and there was abundance of pasture and winter-fodder.

To continue the history of this flock, the coarser kind of sheep were almost all removed in the year 1781, and the wool was no longer sold at six dollars, as it was now worth more than seven.

In harvest 1781 some rams were bought at Count Vizthum's sheep-cote for five dollars a head, and attempts were made to procure some genuine Spanish rams from the Elector's flocks which, including every expence, cost 10 or 11 dollars each.

The agent, who had been employed to buy the rams, was shewn by the steward of Count Vizthum's estate at *Sausiedels* the wool-account since the last spring-shearing, according to which 875 head of sheep of one shearing had yielded 16 cwt. and $3\frac{1}{2}$ stone or $83\frac{1}{2}$ stone of wool (the stone of 22 lb.) which was sold thus ;

	dol.
24 stone to a merchant from Brabant,	
at 13 dol. per st.	312
59 stone to a Leipstick merchant, at 12	
dol. per st.	714
Total -	1026

So that 100 head brought in 118 or 119 dollars.

A new shepherd was taken at Michaelmas 1780, who was not allowed to mix any of his ewes with the flock. He brought 35 coarse wethers of two, four, and six teeth.

There were shorn 705 head of fine-fleeced sheep, which yielded 916 lb. of wool, that is, almost 130 lb. for every 100 head.

The 35 coarse wethers yielded 48 lb., that is, only 7 lb. more, than the same number of the fine-fleeced flock.

But considering, that wethers bear more wool than ewes or yearlings, this difference of 7 lb. falls away.

Those coarse wethers are fed and stalled just as the fine ones are.

A comparison

A comparison of one flock with another of the same breed.

C got shorn in spring 1782,

510 Wethers, old and young,

131 Yearlings, &c.

383 Old sheep,

22 Rams,

Total 1046, which yielded 75 ft. 10 lb. of wool.

B got shorn in spring 1782,

510 Wethers old and	} which yielded, for every
young	
131 Yearlings, &c.	100 head, 6 ft. 5 lb. in all
	39 ft. 16 lb.

383 Old sheep, which, at 6ft. 10lb.

for every 100 head, yielded 24 ft. 15 lb.

22 Rams at 3 lb. per head	.	3	—	—
---------------------------	---	---	---	---

Total 1046 head.

Total of wool, 67 — 9

So that C got more wool than B by almost 17 lb. for every 100 head, or one sixth more for each head. But C had better pasture on the *lagerberge*, where there are many waste lands.

Account of the wool yielded by Spanish sheep at Kloster Rode.

	ft.	lb.
307 Spanish sheep, shorn in spring 1774, yielded	21	: 20 $\frac{1}{4}$
868 Common sheep, do.	56	: 5 $\frac{1}{2}$
300 Spanish sheep of a year and a half and two years and a half old, shorn in harvest 1777,	14	: 5 $\frac{1}{2}$
982 Common sheep, including 300 lambs, shorn, do.	42	: 16 $\frac{1}{2}$
416 Spanish sheep, from two years and a half to three years and a half old, shorn in harvest 1778,	24	: 8
942 Common sheep, including 314 lambs, shorn, do.	34	: 10

In the whole of the harvest-shearing of 1781 my friend has had the most convincing proofs, that the Spanish sheep yield more wool than the common ones, whereas 300 common ewes afforded 264 lb. and 106 Spanish ewes gave 128 lb. On each side were ewes, and they were fed in one and the same place.

Accordingly, a Spanish sheep yielded one pound three ounces and a quarter, while a common sheep yielded but three fourths of a pound.

From what has been hitherto observed, it appears, that the proportion of $3\frac{1}{8}$ lb. of coarse wool to $2\frac{1}{2}$ lb. of fine wool for every head, shorn at
one

one and the same time, and fed in the same manner, does not hold good, particularly at *Kloster Rode*, where there are to this very day sheep of both kinds.

The quantity of wool, if not intirely, yet must very nearly continue the same, as I have asserted already.

Spanish rams were let out, for the first time, at *Kloster Rode* in 1777, that is, seven years ago. There is now existing there a third generation, but still there remain some old common ewes. They sold the fine wool in harvest 1781 for five dollars per stone of 22 lb. and the coarse wool for two dol. eight gr. Before that they got for fine wool more than five dollars, especially for spring-wool, which is longer than the other.



A COMPARISON BETWEEN THREE DIFFERENT SORTS OF
SHEEP.

*A Letter from Captain VON VELTHEIM,
Harpke, March 10.*

With regard to the Spanish sheep, Mr. — should have proposed the question thus ; how much more wool do the Spanish sheep yield ? If we except the *Eiderstadt* sheep, they yield more than any German breed. I have an account and calculation of the wool produced, taken from three years experience here at Harpke. To this must
be

be added the difference in the price. Although we live in *Ecclesia pressa*, yet I have received much more for the Spanish wool, than for all the rest besides,

	dol.	gr.	
Viz. for Spanish rams wool	8	: 0	} per stone.
Spanish ewes, do.	7	: 0	
Half-improved sheep, do.			
and lambs, do.	6	: 0	
Sheep's wool on an average	3	: 6	
The rest of the common wool	3	: 0	

These prices are to be understood at the rate of five dollars to the Louis d'or. My sheep are generally of one shearing, and are likewise generally salved. My half-improved Spanish breed are not milked, which contributes to the melioration of the wool and of the breed. The Spanish sheep are still more lasting and strong than the common ones, and even more than the half-improved sheep. Nor is the wool of the Spanish sheep altered in the least, or grown more coarse, not even in the fourth generation.

The lambs, that fell this year, are extraordinary fine, strong, and healthy. The Spanish breed in my opinion is fit only for places, where there is dry and mountainous pasture, which they like.

ACCOUNT.

ACCOUNT.

Rams	{	Spanish . . .	about 11 head	yield two stone
				(the stone of 22 lb.)
		Half-improved . . .	13 head .	two ft.
		Common . . .	7 head .	one ft.
Ewes	{	Spanish . . .	13 head .	two ft.
		Half-improved . . .	15 head .	two ft.
		Common. . .	8 head .	one ft.
Yearlings	{	Spanish . . .	about 7 head .	one ft.
		Half-improved . . .	15 head .	two ft.
		Common . . .	9 head .	one ft.
Rams	{	Spanish . . .	100 head	about 18 ft.
		Half-improved . . .	100 head .	15 ft.
		Common . . .	100 head .	14 ft.
Ewes	{	Spanish . . .	100 head .	15 ft.
		Half-improved . . .	100 head .	13 ft.
		Common . . .	100 head .	12 ft.
Yearlings	{	Spanish . . .	100 head .	15 ft.
		Half-improved . . .	100 head .	11½ ft.
		Common . . .	100 head .	11 ft.

REMARKS.

Hence it is evident, that fine Spanish wool is at least not less in *quantity* than the other sorts. I know of a Spanish flock, that gives more than any of the neighbouring ones; but some of these are badly kept and are too full. I would not make the quantity of wool produced very great, because it might be so, where the number of sheep were small; for, if the whole flock be of the fine kind, there is some diminution in the relative quantity.

Fifty or an hundred head are usually stalled by themselves, better fed than the rest, and watched separately; this is certainly the case at Harpke.

The Saxon shepherds, whom I have spoken with in places, where there are Spanish sheep, have all assured me, that 100 head, although very well fed, yield one with the other only 11 or 12 stone of 22lb. I am therefore surprized, that at *Harpke* 15 stone can be got from 100 Spanish ewes. There were at Harpke, six years ago, two genuine Spanish rams from the Elector's flock, and 40 ewes from a private flock near Dresden; and five years ago there were ten rams and 50 ewes there in spring, which last were got from *Wolkau*.

The shepherds of *Wolkau* also allow only 11 or 12 stone for every 100 head. I believe that the word *about* (in Captain Veltheim's letter) means *not quite*, or that the sheep must have been taken extraordinary care of. But, when the whole flock at Harpke will be improved (on the 10th of March 1782 there were 800 head there, and the whole of the improvement is to extend to 2000) they will not yield so much in proportion.

As to what was said of the Spanish sheep liking mountainous tracts, I hold it to be of no consequence. I have already adduced an observation, that they like low places; and where are those great mountain-pastures in Saxony? The greatest part of that country is level ground. I
allow

allow, that mountain-pastures have some advantages, and that the wool may be somewhat finer upon them; but in one and the same climate, a man can perceive no difference in the wool—either with his sight or touch, nor perhaps by examining it with a microscope.

Finally, I shall annex a printed account taken from the *Leipsick Gazette* of the year 1777. At page 156 there is a comparison, from the frontiers of Bohemia, between the common sheep of that country, and the improved Spanish breed.

One hundred head of common sheep yield ten stone of wool, which, if sold at the average price of the present year, viz. at $6\frac{1}{2}$ dollars per stone, will bring in 65 dollars.

One hundred head of Spanish improved sheep, at the rate of nine head for every stone, yield certainly 11 stone of wool, which however is much inferior in fineness and value to that of the original Spanish rams. If sold at 8 dollars per stone, the current price of this year, it will make 88 dollars.

The quantity of wool produced is, as every body knows, very different according to the difference of the years. This has been a very bad year in this place; for ten head, counting weathers, sheep, and yearlings, one with the other, yielded only one stone of wool. There have been years, in which eight head gave a stone. But in a common year we reckon about nine head

for every stone of wool. At each time the produce of the Spanish breed was in the same proportion. If one has healthy and clean sheep, he may expect a similar produce constantly, provided he do not overstock himself in summer, nor let them be hungry in winter, and be not sparing of *salt* at the due time.

As to the forementioned Spanish breed, (for since three or four years I have not let out any other rams, but those of the Spanish kind, that were reared here) it is not yet proved, that the lambs should be at each falling of the real Spanish kind. There happen to fall, almost every year, three sorts of lambs, viz. 1, quite Spanish ones, which both in their wool and shape shew their breed; 2, half-Spanish lambs, in which indeed you will find the Spanish shape and a close compact skin, but not the fineness of the wool; and 3, German or loose-skinned lambs, which have neither the Spanish shape, nor yield any other sort of wool, but such as stuff-manufacturers can make use of. But this is to be understood only of the first, second, and third generation; for it does not happen, when both father and mother are of the *improved kind*, nor does it happen when the father and mother are both natives of *Spain*. Here at Grœbzic, seven Spanish lambs fall constantly for every German one.

I must also observe, that in selling the March-sheep of the Spanish kind, one can reckon upon
from

from two to four Groschen additional in the price of each head, as the butcher can sell their skins to more advantage, than those of the others. This is a material object, where there is a large flock.

To conclude, no other treatment either as to pasture or winter-foddering, nor any greater expence is requisite for the improved breed of sheep, than for the common ones; it is therefore easy to determine with accuracy the advantage of improving. I had almost forgotten to mention the quantity of wool, which a sheep yields in Spain. According to the Spaniards reports one would imagine, that the quantity of wool given by a sheep there is very different from what a sheep yields in our climate.

They reckon 5 or 6lb. of wool for every sheep, so that 4 or 5 head will yield an *Aroba* (of 25lb), and from 6 to 8lb. for every ram, so that three or four rams will give an *Aroba*.

But as this is to be understood of unwashed wool, (they do not wash the wool before shearing, as already explained) as well as all the calculations that we have made hitherto; and as wool loses one half of its weight in the washing, it follows that the effective produce in Spain is from $2\frac{1}{2}$ to 3 lb. for every sheep, and from 3 to 4 lb. for every ram.

However, as the Spanish pound is equal to ours, being 16 ounces, there is still a difference in the quantity of wool, which difference must be attributed

buted to our pastures being poorer and worse than theirs. The *merinas transhumas leonesis* enjoy plenty of fresh and green pasture the whole year round, with very few exceptions.

I believe I have collected all that can be said on this subject, and shall now pass to the prices of wool.

CHAPTER XIII.

OF THE PRICE OF WOOL,

IN SPAIN.

THE price per Aroba of No. 1. or R. F. is 280 réal de vellon, or 19 dollars, 20 gr. 9³/₄ pf.

Of the second sort 240 réal de vellon, or 16 dollars.

Of the third sort 200 réal de vellon, or 13 dollars 8 gr.

Of the fourth sort 160 réal de vellon, or 10²/₃ dollars.

IN SAXONY.

What Spanish wool sells for at present at Leip-
sick I cannot say, as I have not regularly received
the Leipstick Gazette. I mean Spanish wool im-
ported from Spain. It used to be sold for a long
time past in Saxony and Brandenburg, for 1 doll.
12 gr. per pound.

The current price in Saxony of a stone (of
22 lb. Leipstick weight) of genuine Spanish wool,
that is, of the wool of a genuine Spanish ram or
sheep of the Elector's flock at Stolpen is 18 dol-
lars.

Of the wool of an improved flock in Saxony,
such as those of *Schænewælke*, *Sausiedels*, &c.
where Spanish rams have been used these 19 years
past, 12 dollars 13 gr.

Of the improved country wool . 6 dollars.

Of the common coarse wool . 2 dollars 6 gr.

IN ANHALT DESSAU.

Counsellor Ranmer at Wœrliz, sells the stone
for 6 doll. 18 gr.

The Prince's administration at Dessau, for
6 doll. 12 gr. and this is Silesian wool.

The

The head bailiff Holzhausen, for 5 doll. 12 gr.

The other agents, according as they have Silesian or coarse common wool, from 6 dollars, down to 2 doll. 12 gr.

Of the Hanoverian Spanish wool.

I am surprized, that fine wool does not bear as good a price in that country, although it is of one shearing, as it does with us, and that they have not yet fold, or been able to sell the stone of 11 lb. for three dollars.

It is true, that, when there happens to be a small quantity of fine wool in a country, where the wool is generally coarse, it is taken little notice of. 'Tis Hanoverian wool they say, what can it be good for? Foreign buyers do not look for fine wool there, and the country buyers do not know the value of it. It is therefore always adviseable to shear the fine wool separately, and to sell the inferior wool by itself.

CHAPTER XIV.

OF THE DISEASES, THAT SHEEP ARE SUBJECT TO,
IN SPAIN.

1. THE *scab* (la Ròna.) To cure it, they make use of an ointment, which they call *Miera*. It is prepared from the trunk and roots of a tree called *Enebro*, which is very like our Juniper tree*, by breaking them into small pieces, and infusing them in water, without adding any thing else.

2. *Basquilla*. This is a terrible kind of sickness, which often causes great destruction among the sheep in Spain, and proceeds from their being kept on dewy grafs. The symptoms of it are these; the sheep gets a stiffness in its feet, its ears grow
o thick,

* The word *Enebro* literally signifies the Juniper tree. There is indeed some little difference between the Spanish Juniper trees and those of northern countries, owing to the difference of climate and soil. But still our author should not have looked upon them as two distinct sorts of trees, or given a description (which I here omit) of what every body understands. Tr.

thick, and at last it cannot eat. Sometimes they recover, if they be blooded in time; but the greatest part of them die of it, some very soon, and others after six or nine days illness.

3. *Quick blood* (Schnelblut) is what Daubenton calls *la Chaleur* or heat of blood. We will say more about it by and by. In those distempers, which proceed from the nature of the blood, such as *Quick blood*, *Basquilla*, &c. bleeding is used.

4. The *Dizziness* is an incurable disorder. According to accounts received from several *cabannas*, it is well known in Spain. But they have discovered no remedy for it as yet. Be it a sheep or a ram that begins to be affected with it, the Spaniards kill it immediately, not so much that they look upon this distemper as contagious, as for the purpose of making use of the flesh, while it is still good.

5. Nor is there any certain remedy known in Spain for the disorder, which the shepherds in Germany call *Seuche**.

IV

* The word *Seuche* signifies *disease* in general. What particular disease the shepherds mean by it, I cannot discover. Tr.

IN SAXONY AND DESSAU.

The *scab*. At the Elector's Spanish sheep-cote, where the scab appears sometimes, they boil some ellebore in vinegar, and with this infusion they wash the affected part. As turpentine, and pitch or tar spoils the wool, and makes it apt to fall off, and as a mere infusion of tobacco is not in all cases a sufficient remedy, some persons have made the experiment to cure the scab with saturn †, and have found it to answer just as well as could be expected.

They say, that, when it is applied in time, the wool continues good and unaltered as to its colour without falling off; but, if the skin be already hardened and consumed by the scab, so as that the wool be out of the skin and hanging merely from the scruff, in such case it is not possible to bring back the wool to its growth. Besides, the health of the sheep is not injured by *saturn* remedies, nor do they cause such burnings and smartings, as turpentine and tar do.

Goulard's chemical writings have encouraged the use of them. Those, that approve of these remedies, find them cheaper and better than the infusion of ellebore.

† In the original *Bleimittel*, that is, remedies extracted from lead or saturn. Tr.

An ointment is sometimes made of *oil of olives* and the extract of *saturn*; but it has been found, that the oil rather hinders than promotes the effect of it, besides its being dearer than that made up with tar.

On the contrary, others say and indeed with greater probability, that the aforementioned remedy, which is known under the name of *Goulard's aqua vegeto mineralis*, is an excellent resolvent and strengthening remedy, but not fit for sheep.

It can be applied, they say, to men and horses with good success in the following cases, viz. in inflammations of the eyes, ophthalmias, and weakness of eyes, as also for the preserving of sound eyes, and to furbated horses, if the tendons are not stripped.

According to *Daubenton*, the best remedy of all, as likewise the least expensive and the most easily applied is, to take a pound of tallow or suet, and melt it, and, when taken off the fire, to mix it with a quarter of a pound of oil of turpentine.

The disease, which causes very great heat in the sheep, is called by the same name viz. the *beat* (Hizze). The best fed, strongest sheep, and that have the most blood, are principally subject to this illness. The sheep affected with it open their mouths; they foam, and have a rattling in their throats; blood flows from their noses, and
one

one feels a great palpitation under their ribs. Their eyes grow red; they hang down their heads; they stagger and shiver, and in a short time drop down dead. All these symptoms indicate the necessity of bleeding, which, if done in due time, is an effectual cure for this disease, either in hot, temperate, or cold climates. *Vid. the Leipfick Magazine 1781, part 1, p. 76; Of the most necessary remedies for sheep by Mr. Daubenton; from which I thought it requisite to transcribe this extract, as in last harvest the fattest sheep of our flocks died of the heat, owing to the ignorance of our old fashioned shepherds.*

I now conclude, referring my German readers, for what concerns the diseases of sheep, to *Mr. Wichmann's Catechism for shepherds*, which is taken from *D'Aubenton's Instruction pour les bergers et pour les propriétaires des troupeaux*.

THE TRANSLATOR TO THE READER.

THE author says in the preface, that this Essay was the result of an extensive correspondence between some intelligent rural economists, whose memoirs and observations were handed over to him for the purpose of putting them in order, and of forming them into one body. He has taken his account of the sheep-cotes and sheep in Spain, from the manuscript memoirs of a native of Dresden, who had been in that country.

Some incidental details and observations, relating to local circumstances, and unconnected with the object of the Dublin Society, are omitted in the Translation.



EXTRACTS
FROM THE
FOREIGN COMMUNICATIONS
TO THE
BOARD OF AGRICULTURE
IN LONDON.—VOL. I.

(GERMANY.)

*Mr. G. G. Marwedel on the Heath Flocks of Sheep,
that graze on the Wastes of the Duchy of Lunen-
burg, and Margraviate of Brandenburg.*

THIS species is seldom met with, except in certain plains of the Duchy of Lunenburg, and of the Margraviate of Brandenburg, where there are extensive wastes and heaths.

They differ from the other sorts styled *noble*, as well in shape as size, and in the quality and goodness of the fleece. The sheep now under consideration are smaller than the others, their fleece inclines more to the quality of goats' hair, than wool, and its colour is generally brown or
P black,

black, seldom white. Their ordinary food at all seasons is ling or heath, which they find in their pasturage.

As they are seldom kept in a house, they are obliged to seek their food abroad in all weathers, while sheep of other sorts are fed within doors, during the severe cold seasons.

— “ Stabulis edico in mollibus herbam
 “ Carpere oves, dum mox frondosa reducitur ætas :
 “ Et multâ duram stipulâ filicumque manipulis
 “ Sternere subter humum : glacies ne frigida lædat
 “ Molle pecus, scabiemque ferat, turpesque podagras.”

VIRGIL. GEO. LIB. III.

Respecting the other distinctive characters of the heath flocks, I shall describe them by answering separately the Queries proposed to me.

Query 1. *Is the breed, so far as it can be ascertained, a native, or a foreign species? is it wild or domesticated? hardy or delicate?*

Answer. The species is absolutely genuine, and originally belonging to the country, in a pure state, without any foreign mixture. I have coupled ewes with foreign rams of a better quality, but the result has shewn, that the breed from a foreign stock has degenerated after the third generation into the common sort. The ewes, it is true, with such foreign rams, had lambs of a cross breed, but they did not take kindly to the climate, not finding pasture suited to their texture, on our heaths, where the ground is swampy, and the climate severe.

This

This species is quite domesticated, neither wild, or inclinable to stray. Their constitution being hardy, they are far from being affected either by the nature of pasturage, or pinching cold. Yet, notwithstanding this aptitude to endure by day the piercing cold of the season, when the ground is covered for several months with snow, the chilling north winds in winter, or the heat of the dog-days, they cannot, without apparent danger, be folded in the open fields during the night; the cold and damp soil of our heath will not admit of it.

Of all sorts of sheep, there are none so easy to provide food for as these, since they have nothing but what they find in the open air on the grounds where they pasture.

Q. 2. Is this breed understood to be pure, or has it been crossed with other breeds? In what respect does it differ from other sheep, as to size, shape, or other circumstances?

Ans. In general, the sheep in question are of a pure breed. Several attempts have been made to mend the breed, by a cross with a foreign ram and the ewes of the country; but the success has not answered equal to the pains taken.

The difference between this breed and others, consists in the following particulars:

- 1st. They are in general horned.
- 2d. The tail is shorter, and most commonly very small.

Length of a ram from the chest to the tail.			height from the foot to the spinal bone.	
A ram	$1\frac{1}{2}$ feet	42 lines	-	1 foot 60 lines.
A wether	-	$1\frac{1}{2}$ 42	-	1 60
An ewe	-	$1\frac{1}{2}$ 20	-	1 40
A yearling lamb	1	50	-	1 50 F. measure.

3d. The ewes are never milked, as they afford so little, that often two ewes together do not yield enough to suckle one lamb.

4th. The fleece is generally grey, brown or black, and very seldom white.

5th. The fleece is neither tufty nor in curls, but smooth like goats' hair, except in lambs just dropped, which is frizly till the first time of shearing.

Q. 3. *What is the average weight of the carcass, and of the different quarters ; and what the number of ribs ?*

Ans. These are as follows :

1st. A wether, without the head and entrails, from 25 to 50 lbs.

2d. A ewe, that has never lambed, or had a tup, from 22 to 24 lbs.

3d. A ewe of 7 or 8 years old, past the period of having lambs, from 15 to 16 lbs.

The head weighs 2 lbs.

The lambs are not killed for culinary purposes, on account of their smallness, therefore it is needless to specify their weight.

One foot in our country contains 129 lines, French ; a French foot 144 ; an English foot $155\frac{1}{8}$. Our foot has 12 inches of $10\frac{3}{4}$ lines, French ; an inch of France 12 ; an English inch $11\frac{1}{7}$.

In

In weighing wethers and ewes with their fleece and intestines, it has been found that a wether, and such sheep as had never been put to a ram, well fed on the commons, weighed from 60 to 70 lbs. A ewe that had lambed, and suckled her lamb in the course of the year, weighed from 40 to 50 lbs.

The wether is generally cut up into four parts; the hind quarter weighs from 8 to 10 lbs.; the fore quarter from 4 to 6 lbs.

These animals have thirteen ribs on each side.

Q. 4. Is the mutton remarkable for its goodness, flavour, taste, or delicacy?

Ans. The flesh of a wether, or a ewe, well fed on the common, or fatted within doors, is more delicate and savoury than that of any other sort of mutton. It is more tender, less rank, and in taste resembles that of a tame chevreuil. The smoked hams of such mutton, well fatted, are delicious.

Q. 5. What is commonly the weight of the fleece?

Ans. (A.) Winter.

1. Of a ram - 2 to 3 lbs. (French)
2. Of a wether - 2 to $2\frac{1}{2}$
3. Of a ewe - 1 to $1\frac{1}{2}$ lbs.
4. Of a yearling lamb $0\frac{1}{2}$ to $0\frac{3}{4}$

(B.) Summer.

1. Of a ram not closely shorn in summer, not to lessen his vigour when put to the ewes in autumn - $\frac{1}{3}$ to $\frac{1}{2}$ lb. (French)
2. Of a wether - $\frac{1}{2}$ to $\frac{3}{4}$

3. Of

3. Of a ewe - $\frac{1}{3}$ to $\frac{1}{2}$
4. Of a lamb of the preceding spring $\frac{1}{2}$ to $\frac{3}{4}$

The price of the fleece is determined by the answer to the following Query.

Q. What is the quality, the length, the colour, and the price of the wool? and for what kind of manufacture is it best adapted?

Ans. The wool of these sheep resembles more goats' hair, than the wool of any good breed of sheep. It is hard and coarse, and scarcely ever observed to be soft or fine. At the first shearing the wool of the lambs is softer and finer than the successive shearings, or the wool of ewes. Its colour, as beforementioned, is grey, brown, or black, seldom white.

The length of the wool, measured on the top of the back, is,

1. Of a ram 8 to 9 inches
2. Of a wether 6 to 8
3. Of a ewe - 6 to 7
4. Of a yearling lamb 4 to 5

The winter wool being harder, coarser, heavier, and less fine, than summer wool, which is softer, finer, and lighter, according to the preceding Answer given; the white wool, and above all the summer wool, is dearer than the coloured wool, and is valuable in the same degree as the wool of lambs.

The

The common price of the fleece is,

- | | | |
|----|---|---------|
| 1. | For 10lbs. of winter grey, brown, or black wool | 3 to 4 |
| | livres (French.) | |
| 2. | 10 lbs. of winter white ditto | 6 to 7 |
| 3. | 10 lbs. of summer grey, brown, or | |
| | black ditto - | 6 to 7 |
| 4. | 10 lbs. of summer white ditto | 8 to 10 |
| 5. | 10 lbs. of lamb's wool. - | 8 to 10 |

The weight of 10 lbs. in the purchase and sale of wool, is called *stein* (a stone).

The owners of flocks do not sort their wool in any other way, than by separating the white from the grey, brown, or black, before they sell it. But the wool dealers have their method of sorting it, separating the white from the coloured, and the fine and soft, from the harsh and coarse.

The sheep skins not sheared are rarely saleable, as our curriers can do nothing with them. But for the bare skins, without the fleece, the curriers and tanners buy them at the rate of, from 28 to 30 livres (French) the hundred.

When the ewes are too young or feeble to have milk sufficient, the lambs are taken from them, a few days after they are dropped. These latter are killed and skinned, and the skins are sold in the state they are in, at the rate of, from 32 to 36 livres Tournois the hundred, to the skinners; who having dressed them, they are made use of as furs.

The

The sheep's trotters, which our papermakers use, to make paste for paper, are sold at the rate of sixty, for four *sous*.

By the use made of the wool, a judgment may be formed what purpose it is best suited to.

The wool of the lambs is sorted with the finest summer wool of the ewes, white and grey, and is made up into hats in our country. Of the winter grey and white wool mixed, they make frieze, flannel, coarse cloth, and a stuff worked up with flax or hemp thread; and a woof of woollen thread dyed of different colours; this is called *éttoffe à deux trames*. With the winter grey wool, they manufacture a stuff termed *Manchester beath*.

In regard to exportation, our wool is sent to Brabant, Flanders, and the other parts of the Netherlands; to Holland, to Saxony, and even to England, where the wool of the lambs, and the fine white summer wool, is worked up by the hatters; and the white summer wool mixed with ox hair, serves to work up the list of cloth.

With the white winter wool, they make stockings at Bremen and in Brabant, as well as caps, coarse cloth, and rugs, for the peasants; and formerly before the revolution in France, coarse stuffs for the garments of capuchin friars. They work it up, in all manner of coarse stuffs and mattraffes.

In Bremen, and in Westphalia, with the winter grey wool, sorted with white wool, they
make

make a cloth, which is sent to Holland, and is in request amongst sailors.

In England, our fine white and grey summer wool is worked up into sailor's hats, and all kinds of coarse cloths, stuffs, and list.

Q. 7. At what age do the breed arrive at perfection? and what is the average quantity of its tallow when fat?

Ans. These sheep arrive at perfection as follows:

1. A ram is in perfect order for the ewe at the age of two years: and no longer fit at the age of five. Then he is castrated, by binding the testicles, which fall off after some time.

2. Wether mutton is good for the table, at the age of four or five years.

3. A ewe is fit for a tup, and to drop her lamb, from two to three; she continues in that state till seven or eight. Sometimes, but very rarely, they are fruitful until ten or eleven.

Their age is known by their occillary teeth, of which when lambed they have eight. And they lose,

(A.) In their first year two; so that the second year they have only six teeth.

(B.) They again lose in the second year two; so that in the third they have only four.

(C.) They again lose in the third year two; so that in the fourth year they have only two.

Q

(D.)

(D.) They further lose in the fourth year the last two: so that when they are five years old, at latest, they have lost all their occillary teeth, which are replaced by incisive ones.

The sheep's teeth are commonly worn out at the age of seven or eight years, and they are no longer able to browse on ling; or to suckle a lamb. Their lot is then cast; they are fatted, and appropriated for the food of peasants and servants.

A wether well fatted in the *communage* at the age of four or five years, as the herbage of meadows is too scarce and precious for the pasture of sheep, will produce four or five pounds of fat.

Those abovementioned, destined for the food of peasants and servants, have two pounds.

Those meant for the kitchen, and fatted within doors, or in a stable, fed with corn, good hay, and other proper food, will have six pounds of fat.

Q. 8. *What in general, is the number of lambs at each birth? at what season of the year do they lamb? and are the lambs well covered with wool when born?*

Ans. The heath ewes drop no more than one lamb at a time. It is very rare that they drop two together. They are in a state for the ram six or eight weeks before Christmas, and drop their fruit in twenty weeks after conception, which event generally happens in the months of March and April.

The

The lambs, when dropped, have a tufty and frizly, soft, fine wool. It retains these qualities till the first shearing time, about the feast of St. John the Baptist.

Q. 9. What is considered to be the best method of managing the breed? to what food are they most accustomed, or seems best to agree with them?

Ans. To treat these sheep in the manner best suited to their nature :

1. The stable should be large, and at least nine or ten feet high, that the exhalations, as well from each other, as from their dung, may easily evaporate. For the same reason, the gates of the sheepfold should also be left open, while the flock is browsing in the open fields, to ventilate it, and purify the air by a more free circulation.

2. In the stable, every four days a new litter of dried clods* from the heath should be placed ; under which, in winter, it would not be amiss to strew a layer of horse dung. The litter should never be of straw, the evaporation of which is pernicious to sheep, as it makes them perspire too

Q 2

much,

* These clods of turf are cut with great dexterity by means of a spade of a very simple construction, which cuts only the dry surface of the heath, in pieces when dried about an inch thick, a foot long, and about six inches broad. These clods also serve for fuel to poor cottagers in villages, and in the neighbourhood of these heaths.

much, and catch cold when they return into the open air.

3. The flock should be let out upon the common every day, let the weather be ever so cold or windy; if the snow lies too thick, and prevents them from browsing abroad, then the peasants are under the necessity of scraping away the snow, and scratching up the ground, with an implement termed a *snow-plough*, with which they carry off all the snow.

4. Great care should be taken in the spring, autumn, and winter, to prevent the flocks from browsing in swamps, filled with noxious weeds and leeches, or in low grounds, and meadows overflowed, either from much rain, or otherwise.

The plants most noxious to sheep are as follows:

Centimorbia, *Nummularia*, or *Serpentaria minor*.

Agrostis, *ulva*, *juncus*.

Spergula (spurrey); much of it is found in fields sowed with buck-wheat; it is still more hurtful to sheep, who feed on it after much rain.

5. When the flock has browsed all day upon fallow grounds, or amongst stubble, they should not be led back to their folds, till they have browsed upon the common, for an hour or two at least. Green herbs are too succulent, too compact and heavy, consequently too hard of digestion, for the stomach of heath sheep, accustomed to browse upon ling, which is a vegetable of a more solid substance,

substance, and being mixed with green herbs, corrects the richness of their flavour.

6. To prevent the sheep from the distempers caused by rain and snow, household salt is given to them, either to lick, or to eat, mixed with the dried leaves of tansy, reduced to powder, and *millefolium* and *origanum*, *origanum heracleoticum*, *enula campana*, *helenium*, *aristolochia*, *absynthium*, *gentiana*, and juniper berries.

The common and most profitable food of these sheep is ling, from whence the name has been given to the sheep. There are flocks, which from year to year have no other food, than what they can pick up on heaths and wastes. It is only in the months of December, January, and February, when the ground is covered with ice, that they are left to browse on the verdure in the fallow grounds, cultivated the preceding autumn. When during winter there is too much snow on the ground, for the flocks to go out into the fields to find sufficient pasturage, *they give them cut ling within doors, which had been previously stored up for them the preceding autumn,** or oat straw, or straw of rye, buck-wheat, peas, or rape.

To pregnant ewes, and to lambs dropped the year preceding, to strengthen them, they often during the months January, February, and March, when

* This is an important fact, and heath or ling hay may be intitled to the attention of our mountain shepherds in the northern parts of England and Scotland.

when it snows or rains, give buck-wheat or oats in the morning when they go out, and at night when they return home.

They also give them good hay, mixed with straw; but this only in the winter season; for on the approach of spring, when the grass begins to shew itself in the fields, hay is no longer good for them, the lambs excepted, to which, after they are six weeks old, good hay is given, and the leaves of beech and hawthorn, and occasionally a few handfuls of buck-wheat.

To be provided during the winter season, and snowy weather, with provisions for the flock, and to have wherewithal to furnish them with litter in the stable, it is proper in autumn, when the weather is fine and clear, to cut as much turf and broom as may be wanted for the purpose.

Q. 10. *To what sorts of diseases is the breed particularly subject, and how can they best be prevented or cured?*

Ans. The distempers, to which these sheep are the most liable, are.

1. The *Homorrhage*.—This distemper proceeds from obstructions, which having rendered the feculent matter corrosive, occasions their attacking the intestines to such a degree, that the excrements can only pass the gut of the anus clotted with blood. The sheep affected perish in three or four days, if there is any delay in giving them relief.

As

As a cure, they give them a spoonful of olive oil, or goose grease; and to obviate the constipation, they are obliged to pull away with the fingers the excrements, that stop the natural passage. This operation, which should be repeated until the obstruction ceases, can hardly be performed without an effusion of blood. Some cure it with a bolus of salt butter and foot well powdered, about the size of a goose's egg. After these two ingredients are well mixed up, the bolus is divided into four parts, of which, one must be swallowed every morning. Before this is administered, it is well to bite the tip of the sheep's tongue, until a few drops of blood ensue.

2. *Phthific*.—The symptoms of this distemper are a weakness, falling away, and panting, and at times a cough.

Cure. Every morning, for three days, three spoonfuls of spring water, with an ounce of household salt infused therein.

3. *Heat*.—The symptoms of this disorder, and the method of cure, are explained at full length by Mr. Daubenton, in his *Catéchisme de Bergerie*, or shepherd's catechism, translated by Mr. Wiechman. I refer thereto the more, as the sheep on heaths are not particularly subject to this disorder.

It is nevertheless probable, that this disorder participates of the *ophthalmy*, a disease, which is more frequent in this breed of sheep, and which, when they are seized with it, renders them blind, and suddenly

suddenly immobile, to such a degree as to lose the power of motion.

The best remedy for this disorder is to bleed them under the eye; as soon as a few drops of blood gush out from the incision, the disorder vanishes.

4. The *Phrensy* or *Sturdy*.—The true cause of this disorder is as yet unknown, unless we attribute it to the excessive cold weather in winter, or the violent heats during summer. The symptoms are an apparent insensibility, and great pain; when grazing, they turn round in a circle in the most giddy manner, without heeding where they go, and insensible of their motion. It is some time before this disorder shews itself, and never without the symptoms abovementioned. Reduced to this extreme, after a period of twenty weeks of illness, the sheep are attacked with a violent pain in the forepart of the head (*sinciput*), on feeling which, one perceives a part of the skull, about the size of a halfpenny, so soft, that it yields to the touch of the finger; under this soft part, there is a blister of the size of a hen's egg replete with a liquid, so fiery and corrosive, that the skull is mollified.

To cure this dreadful disease, there is no other remedy, than with all possible precaution to make an incision in the skull, round the mollified part, in such a manner that the skull be pierced to the brain; by raising and falling that part of the skull
where

where the incision was effected, the blister penetrates of itself by the aperture, and is easily removed. This operation concluded, the aperture is closed, and the wound is dressed with butter or soap.

It often happens, that this malignant blister is not precisely seated in the centre of the *sinciput*, but more deeply in the brain, or under the brain, between the horns. In such case, it is beyond all possibility of cure, and the animal falls inevitably a victim to it.

5. The *Broncocele*—the *Rot*.—The chief cause of this disorder arises from the noxious damps in autumn and winter, aquatic plants, such as the *centimorbia*, and from inundated pastures. The animal thus seized, becomes heavy, languishing, and debilitated; on their leaving the sheepfold the neck swells, and this swelling creates under the throat a kind of swelling, named *goitre* in French, which subsides in the night, after they have been in the stable. When the *goitre* appears the fate of the animal is decided; they die in five or eight days. In the *goitre*, in the intestines, and under the skin of the lower belly, a great quantity of a malignant humour is found, and about the liver a kind of flat worms, or leeches are discovered, resembling the leaves of the *centimorbia*, which move on being touched.

This pernicious disease, though neither contagious or epidemic, is nevertheless sufficient to de-

stroy the greatest part of the flock affected with it: even the attempt to cure it is attended with many difficulties, and hitherto a specific or efficacious remedy has not been discovered.

The best preventive is to keep the flock at a distance from swampy grounds and overflown places, or spots filled with noxious plants, which spring up in autumn and in rainy seasons; some veterinary professors prescribe as a remedy, household salt and juniper berries; they likewise advise an incision in the lower belly of the animal affected, to give discharge to the humours; but the experiments I have made of this fatal disorder have fully proved to me, that all the remedies invented and hitherto practised in order to cure it have proved ineffectual, unless the disorder shews itself at once, and that such remedies are immediately made use of as are proper to destroy the fundamental causes of the disease, before it has got to a height and become incurable, which may be effected by heartening food.

I have tried rye, which I have given to sheep which I suspected, and were probably seized with the disorder, and let them eat as much as they liked. Those not far gone, or the disorder not inveterate, were recovered after a few days by this powerful remedy. The others were carried off suddenly.

6. The *Epilepsy*.—The great quantity of blood, the stoppage of the circulation of the humours, and the choking up of the lymphatic ducts, are the

the primary causes of this disorder, which is in some degree hereditary.

To cure this malady, to which other domestic animals are likewise subject, they cut off the tips of both ears, and after having given them as much of the following mixture as may be collected at three times on the point of a knife, viz.

“Red and white bolus, laurel berries, gun-powder, the whole pulverized, infused, and sufficiently resolved in warm cow’s milk, adding from four to six drops of spirit of turpentine,” they are thrown suddenly into a river, and ducked two or three times.

The *Scab*.—It is remarkable, that the disorders abovementioned, and described, are in no degree epidemic or contagious; but this is not the case with the two following.

The scab is by no means a disorder peculiar to heath flocks; it is even singular that they should be attacked by it. In order to obtain a cure, a great number of remedies have been prescribed, which may be seen in the works of Mr. Daubenton, where a true and circumstantial detail of this disorder may be found, its character, definition, and specific remedy.

That which I approve of, is as follows:

Let the scabby sheep be washed every day in the lees of tobacco, infused in human stale, and steeped during three days in the stable in the dung of the sheep.

8. *The Small-pox.*—When this malady infects the flock in the great heat of summer, or in winter, it is the most contagious, and occasions more ravages than all other distempers.

There is no efficacious remedy for its cure, and one is obliged to leave the flock entirely to the skill and care of the shepherd. At all events, to preserve the flock from the infection of this epidemy, or the spreading of the contagion, when it has shewn itself, there is no method more certain, than the following: I made a trial of it last summer, by which means I saved my whole flock, although that of my neighbour grazed along with mine, and had got the infection.

R. asafœtidæ; nigellæ; camphoræ; aerugæris; flor. sulphur. ana. one ounce. After having pulverized all these ingredients, they must be mixed together, and the whole infused in olive oil, *quantum sufficit*. It is then divided into nine equal parts, each which is put into a little bag of coarse cloth; these are fastened to the necks of nine sheep. Every fortnight this preservative must be renewed, with all the contents, and continued till every danger of the contagion has vanished.

Q. 11. Are there any methods adopted to improve the fleeces, either in quality or quantity, and what are found the most advantageous?

Ans. Several persons engaged in veterinary pursuits, have communicated to us their methods
and

and ideas on improving the wool, and on the regeneration of the fleecy tribe; but among the number of those who have written on this subject, the following have distinguished themselves more particularly, as well by solid reasoning, as by real experiments, and practical knowledge.

1st. Mr. Daubenton, who, according to the observations of Mr. De Buffon, (on the means of renewing in France the good sorts of the fleecy tribe) made experiments at Auxols in 1768, to improve the fleece by folding the sheep. His example has been successfully followed during the winters of 1785 and 1786; as well at Lorient near Valence, in the environs of Bourgoin, and canton of Dauphiny, as in the mountains of La Grande Chartreuse.*

2d. Messrs. Mouron de Caux, and Dupont of Calais, who have endeavoured to meliorate the breed of the fleecy tribe in France, and regenerate the debased breed of French sheep, importing rams and ewes from England.†

These examples have been followed likewise in our country, with the greatest success, particularly at Wulfinghausen, Lucklum, Ahlden, &c.

It

* See *Memoires sur l'amélioration de la laine, et la régénération des bêtes à laine*, in *l'Esprit des Journaux*. November, 1788, page 378. And, *Avis sur le parcage des bêtes à laine*, Juin, 1718, page 363, in the same book.

† See *l'Esprit des Journaux*, Octobre, 1789, article *Moutons Anglois*, page 174.

It is incontestable, and proved moreover by a variety of experiments, that the debased breed of sheep may be regenerated, and made more perfect by rams of a better breed, as well relatively to the wool, as to the form of the animals; and I am convinced that the folding of sheep in winter is an efficacious mode of improving their fleece: but however well founded and ascertained these premises may appear, it cannot be denied, and a thousand experiments prove it, that with respect to improving and perfecting animals of the fleecy tribe, every thing depends upon climate, soil, and the mode of treating the animal. Such are the experiments made by myself, as I mentioned in my answer to the 2d Query, and which confirms the truth of what Virgil observes in his *Georgics*;

Nec vero terræ ferre omnes omnia possunt.

I have made a cross with rams of an excellent breed, denominated *noble*, and the ewes of our country. I have obtained by this experiment a cross breed, preferable as well in point of fleece, as for the animal itself. But the same experiment has demonstrated, to my great regret, “that this improvement only exists during the two following generations; and that this breed is more feeble and delicate than the original cross breed of the country.

“ That

“ That the rams of the good race not being able to bear our climate, nor to subsist on our pastures, pine away and die in a short time ; and that the fleece of this cross breed, though improved, loses in weight what it gains in fineness.” The only advantage I reaped in these attempts towards improvement was, that several of my flock, though they rather dwindled from their primitive breed, preserved, nevertheless, the white colour of the fleece.

The soil, which consists of nothing but heath, only producing ling, and consisting of swampy grounds or marshy meadows, is in general too cold and moist for any other flocks or breed than those of the heaths. Such a kind of soil will neither admit of folding, nor fencing with hurdles, and by its damp exhalations renders the climate insupportable to sheep accustomed to more moderate and milder regions.

Every thing should follow the order of nature ; a race of sheep degenerated may be reinvigorated by a ram of the breed it descends from ; but however original it becomes again, from not being totally degenerated, it cannot be restored to its primary perfection, if they remain in the country, climate, and spot where the degeneracy first commenced ; such spot and soil not affording other nurture than what suits only the sheep indigenated, and not producing any thing agreeable to the nature and mode of feeding both of the primitive
and

and regenerating breed. Remove a plant from a barren soil into a rich one, and the success will be indubitable; from whence I conclude, without having made the experiment, that our heath sheep would undoubtedly answer, and improve in a softer climate, when crossed there with indigenous rams.

But to transplant vegetables or animals who drew their existence from a rich soil and a warm climate, into a cold one, is so contradictory, that one would hardly suppose, and much less flatter oneself with a satisfactory issue. My own experience has convinced me of the truth of this assertion. Having procured horses and horned cattle from more northern provinces than that which I inhabit, I have found them to succeed in this climate and come on admirably. But I experienced just the reverse with domestic animals, which I got from more southern situations.

It follows from all I have said, that, as nature is not to be forced, there is no other advantageous mode of improving the fleece of our heath sheep, than a careful attention to their health, furnishing them with the necessary quantity of good pasturage, and breeding from the best sorts that can be selected.

Q. 12. How often are the sheep sheared in the year? Is there any difference of weight or of quality, between what is shorn in summer or in the winter?

Ans. They shear the heath sheep twice in the year. The first at the feast of St. John, when they shear the winter fleece of the rams, wethers, and ewes, but not of the lambs dropped that year. The second period is four weeks before Michaelmas, when they shear the summer fleece of the whole flock, including rams, wethers, ewes, and lambs. The summer and winter fleeces differ considerably, as well in weight as in quality. The summer fleece is finer, softer, dearer, and above one half lighter, than the winter fleece, which is coarser, harsher, and of less weight and value than the summer wool.

Substance of the additional Information received from Mr. G. G. Marwedel, in Answer to the Queries of the Board, respecting the Use of Heath or Ling-hay in his Neighbourhood.

Query 1. *At what season of the year is the ling cut?*

Answer, Generally in autumn, soon after the corn is got in, with an implement called in German *heid zwitbe*, or a heath fabre, named *heid fabel*.

Q. 2. *At what age is it cut?*

Ans. There is no fixed time for cutting; it depends upon the rapidity of its growth. When it has grown one foot high, which happens in three, four, or five years, according to circumstances, after the land has been burned, to destroy the old ling, the young shoots which spring up, are cut to the surface of the soil, without leaving any remains.

Q. 3. *How is it made into hay?*

Ans. The cut ling remains on the ground from four to eight days, exposed to the open air and the sunshine, in order to dry it. It does not spoil easily, although it should not be dry. It is made into hay to be used for winter fodder, when the want of grafs, hay, straw, or herbage reduces the farmer to that necessity.

Q. 4. *How preserved?*

Ans.

Ans. It is then easily housed and kept on the floor above the stable.

During the winter, when the bad weather prevents the cutting clods of ling for litter, which should be done twice a week, the cut ling is then used, which is given to the sheep at their return from pasture, when the inclemency of the season or deep snow prevents them from browsing. The cut ling is not given to them in the rack, like straw or hay, they take it from the litter.

Q. 5. Is this food nutritive?

Ans. The food thus furnished to this kind of sheep, whether from heath given to them in the stable, or what they get without doors, is perfectly sufficient for their support. And when enough can be found, they require nothing more. But to ewes with lamb, during the winter, and particularly some time before they yean, they give, in order to strengthen them, a few sheaves of corn, some rye, barley, or buck-wheat.

This ling is of three sorts, according to the nature of the soil where it grows.

1. *Sandy Ling*, growing in such situations, on heights and mountains.
2. *Marshy Ling*, growing on black spongy soil, and moors.
3. *Aquatic Ling*, on low spots, in stagnated water.

The first sort furnishes the best food for sheep, as well as for bees.

The second is less nutritive.

The third chiefly sought after by bees in the spring.

Ling is described by Linnæus according to its form and flower, and classed in two kinds, viz. *erica vulgaris* and *tetralix*.

Q. 6. *How much ling will nourish a sheep per week?*

Ans. It is in a manner impossible for me to state the weight of ling necessary to support a sheep during a week, not having taken notice thereof; only observing, that I wanted twelve or fourteen cart loads of cut ling, to make litter in the stable during winter, for a flock of 300 sheep, and besides, to strengthen the ewes with lamb, the number of which might be from 120 to 130; and for the lambs, a cart load of good hay, ten or twelve bushels of oats, or buck-wheat, and two *soixantaines* of rye straw.

I know there are flocks which have neither hay, straw, nor corn, and are obliged to subsist upon ling all the year round, more particularly when the winters are mild. Suppose then a sheep should have cut ling in winter, and fed again on returning to the stable, I would reckon every day a truss of twelve or fourteen pounds weight (as the animal will only eat it when it is tender, not what is hard and twiggy,) would suffice for one sheep; and therefore it would require

quire for a week seven or eight truffles, or from eighty-four to ninety-eight pounds of cut ling : but I am convinced it would be injudicious if it were attempted, to feed a flock in the stable during winter. I would prefer leaving them without doors day and night, which would be more suitable than to confine them in this manner.

His Majesty has now removed me from Hermansburg to this bailliwick on the banks of the Elbe, near Cruxhaven, where I am no longer in a situation to improve my agricultural pursuits, and information acquired at the royal farm at Hermansburg, &c.

Ottendorff, country of Hadeln,
9th July, 1797.

(SWEDEN.)

(SWEDEN.)

Extract of a Letter from Baron Schulz de Schulzenheim, to the President of the Board of Agriculture, dated 3d November, 1796.

I WILL now, Sir, have the honour of answering the questions you have been pleased to propose; first, *how far heath is with us found a proper food for sheep.*—Of heath I have little personal experience; it is the *erica vulgaris Linnæi*, and which is found in no great quantity in the fertile province of Upland, where I reside, and where at least nobody has recourse to it as food for sheep, when there is superfluity of pasture every where. In the mean time, to enable me to answer your question, I have corresponded with farmers in those parts of Sweden where there are fields of heath, and from them have learned, that considerable flocks of sheep can be supported on those outfields, where little else than heath is found, and that by burning it, provided care is taken, that a certain portion of it only is yearly burnt, and that so moderately, that the roots of the old heath are not destroyed. After this operation the young tender shoots afford pasture, not only to cattle and horses, but also to sheep. The burning is more easily performed in
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the spring, before the heath begins to grow, and when the fire in a calm day can be kept within certain bounds. But these heath fields are not so proper for Spanish sheep, yet they have flocks of that kind, and their pasture becomes improved by the *festuca ovina Linnæi*, which commonly comes up among the tender heath shoots, and is further encouraged by the powerful effects of sheep dung ; since the bite of the sheep has the same effect on the young heath, as the gardeners's scissars on different bushes, in promoting a multiplicity of new shoots. On the other hand those farmers, who at once burn off their whole field, to obtain a rich crop of corn from the ashes, subject themselves to a continual loss ; for the barren red sand, of which these lands are generally composed, is incapable of producing repeated crops, and the sheep, as well as the bees, are deprived of their wonted food on heath. The loss in time is likewise more sensibly felt, in the deficiency of winter fodder, as the hay-crop in such places is generally scanty, and few leaf trees are found where heath grows ; all sorts of leaves, properly dried, being otherwise used in Sweden as winter fodder for sheep. Such heaths have mostly succeeded the former, burnt fir woods. All hope of the wood renewing itself disappears, when what little soil there was, is destroyed, whereas before, a few plants grew under protection of the heath, in such places which were secured from cattle. Such abuse has induced
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some to advise the interference of government, by prohibiting the burning of heath; but if an admonition, or a certain limitation, becomes necessary, a total prohibition would certainly be oppressive, because heath of two feet length, and a finger's thickness, is quite unserviceable for pasture, and at the same time smothers all other grass. In many parts of Germany, as Saxony, Brandenburg, and Pomerania, but especially Lunenburg, they lead their sheep out on the extensive heath commons; there the shepherd, with an instrument like the rake of an oven, clears away the snow, on the great field called Lüneburg-hayde, which consists only of turf moss, and barren heath hills. In Iceland the sheep generally are obliged to take this trouble themselves; but this attempt, when the snow is deep, often costs them their lives. Otherwise the snow tends to soften, and make the heath more palatable.

Observations on the preceding Answers.

The above hints may be of considerable service in the mountainous parts of England, Wales, Scotland, and Ireland, where, at present, they find it difficult to support their flocks in the winter season. Whereas, it appears from Mr. Marwedel's communications, that by cutting heath
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or ling, and making it into hay, they would never feel any material distress of that sort. In these kingdoms such hay need not be put into houses or stables, but kept in the neighbourhood of those places where the flocks are likely to be in winter, and given to them out of doors. It is said that such a practice has been successfully adopted in the upper part of Aberdeenshire. The leaves of the birch, the alder, &c. might also be made into hay; and the young branches of the Scotch fir, both sheep and cattle are fond of; so that it is the fault of the farmers, if they have not a sufficient quantity of food for their flocks during the winter season.

(GERMANY.)

*Answers to the Queries proposed by Sir John Sinclair, concerning the Breeding of Sheep in Germany, particularly in Upper Saxony, and the neighbouring Provinces. By John Henry Fink, of Cositz, in Upper Saxony; Member of the Economical Societies, of Zell, Cassel, and St. Petersburg.**

Query 1. *Are the breeds in Upper Saxony of native or foreign extraction? are they wild or domesticated? are they hardy or delicate?*

Answer. There are no accounts concerning the original state and descent of the sheep in Germany or Upper Saxony, and I therefore cannot take it upon me to decide, whether these sheep have been originally tame and domesticated, or otherwise. All I know with certainty is, that Germany, especially Upper Saxony, as far as history goes, has never been without flocks of sheep.

Q. 2. *Are they supposed to be pure, or crossed with other breeds? do they differ in size, shape, or any other respect from other sheep?*

Anf.

* N. B. The value of the coin used in this paper may be easily ascertained by pistoles or louis'd'ors, at five dollars a piece; and the value of the weight by Leipzig pounds, 110 of which make a hundred weight.

Ans. As to the origin and present state of the breeds of sheep in these regions, I shall endeavour to be more particular, and to explain all those circumstances, which are likely to throw light upon the subject.

With regard to the origin of our present flocks, I may venture to affirm, that within the confines of Germany, there is hardly one flock to be found, which could be said to descend from pure German blood. For, though it is probable, that at very remote times, the German flocks were allowed to preserve the purity of their blood, because the old and simple Germans were satisfied with any sort of wool, and therefore did not think of forcing different breeds of sheep to mix with one another; yet it is certain, that about one hundred years ago, a higher value was placed upon fine than coarse wool; and that some of the landholders and tenants, began earnestly to reflect upon the method of improving the quality of this important article of husbandry. The means, which were employed for that purpose, consisted in their procuring rams of the qualities they wished for, from Poland, Silesia, and other countries, and crossing the ewes of their native flocks with them.

This experiment has not only perfectly answered their expectations, and effectually improved the wool of their flocks, but it has also, as soon as it became known, excited the emulation of the other breeders of sheep, and raised it to such

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a degree,

a degree, that throughout all Germany there is, in fact, not one flock to be found of the pure, native, unmixed breed.

But before I mention the properties of this mixed sort, it may be necessary to describe more fully both our foreign and native breeds, beginning with the first.

In the year 1765 the Elector of Saxony, August Frederic, procured 100 rams and 200 ewes from Spain. In the year 1778 the same prince imported into his territories 300 ewes and 100 rams from other countries.

The Spanish sheep have ever since their arrival in Saxony formed a particular flock, distinguishing itself from every other; first, by a remarkably good state of health; for though they were accustomed to live at all seasons in the open air, and to feed on green pastures, as the flocks in Spain, from which they were taken, constantly do, yet they have perfectly preserved their former strength and health, notwithstanding the great change that has taken place in their food and the climate. For in Saxony there is no possibility of procuring any sort of grass from the beginning of December till the beginning of April; nor does the roughness of the winter, which here prevails in those months, allow any species of stock to remain in the fields; a circumstance which rendered it necessary not only to shut up in stables these Spanish sheep, though accustomed to wander about at home,

home, but also to make them live, instead of green food, on hay and straw.

However, this breed not only remained perfectly healthy, but has constantly preserved, in spite of its change of climate, that goodness and fineness of wool, which has always been admired in its parents. The common German sheep, on the whole, are neither so healthy as those from Spain, nor does the fineness of their wool remain so constant as that of the Spanish breed. The cause of this phenomenon shall be afterwards explained. To return,

The Spanish breed in Saxony, which is kept separate from all other breeds, and preserved unmixed, has further distinguished itself; some of its rams having been put to Saxon ewes, the wool of the Saxon flocks has improved to such a degree as not to yield, in point of fineness, to the best sort of Spanish wool.

I have made this experiment, and have, by the use of Spanish rams, perfectly succeeded in converting the coarse wool of my sheep into fine wool, as may be sufficiently demonstrated by the samples of my wool which accompany these observations.

If it should be asked, by what means I have raised the wool of the first pattern to such a degree of fineness as is found in the wool of the second pattern, I can give no other answer, but that during fifteen years I had made it a rule, to cross

cross the ewes of my original breed with no other but Spanish rams; and it is nothing but the constancy I have observed in following that rule, which rendered my wool so fine, and perfectly equal in value to that of the Spanish rams I had used.

I am fully convinced, that my improved wool will never change from better to worse, as long as no blunders are committed on the part of the breeder; that is, as long as I shall take care never to cross a ewe with a ram, the wool of which is inferior in fineness to that of the ewe. In the last case the intended improvement would be retrograde, and the wool become worse.

As to the shape of the domestic sheep in Saxony, and the neighbouring provinces; they are not horned; their head, as far as behind the ears, is covered, instead of wool, with short and strong hair; their legs from above the knees downwards, are grown over with short and strong hair; under the belly they have but little wool; the scrotum in the male sex is very short, and quite smooth, without hair or wool.

As to the breed produced by Saxon ewes and Spanish rams, it is furnished with large and fine horns. These horns, while they are rising above the head, bend a little backwards near the ears, and turn in two, three, or four spiral convolutions, very much resembling the windings in the shell of a snail. The ewes of this breed have no
horns;

horns; the head is grown over on the front, and round the eyes and jaw-bones, with short and fine wool; but all over the nose, and about the mouth, little strong hairs are discovered; the legs are covered with wool, and not with hair, like those of the domestic breed in Saxony; it has more wool under the belly than the inland kind. We may add to this description of the mixed Saxon and Spanish flock, that the scrotum of its rams hangs down below their hind knees, and is all over covered with fine wool. When we compare the size of the unmixed flocks in Saxony with the size of the flocks produced by the mixture of Spanish and Saxon blood, we shall find, that in these respects they do not materially differ.

On the whole, it appears to me that the size and bigness of sheep depend in a great measure, if not totally, on the quantity and quality of their food: for it is known from experience, that large and small kinds of sheep have, in their subsequent generations, either increased or decreased in size, when the pastures on which they fed produced either poor and scanty, or plentiful and nutritive, food.

To return to the comparison between the mixed and unmixed flocks of Saxony; these breeds not only agree in size, but also in their tails, which are covered with wool of an equal length, reaching to the middle of their hinder legs, below their hinder knees.

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In regard to the other breeds of Germany, it is unnecessary to enlarge upon them, since these flocks are not essentially different from those which I have already described. The constitution of the Saxon and German sheep is robust and hardy; they can bear heat and cold, dry and wet weather; nay, they can live amidst snow and ice without danger, provided they be well supplied with sound and nutritive food, and have not been deprived of their natural clothing.

But if the last take place, and the flocks, after being clipped, are either thus exposed to cold and rainy weather, or are shut up in folds, on a free and open ground, many fatal consequences are likely to arise from such a practice; and I know from experience, that a great part of the flocks thus treated, have either perished, or lost much of their usual strength and vigour.

There is another kind of sheep, however, which is found in Holstein, especially in the surrounding regions of Eiderstadt, in Dietmarsen, a province of Holstein, in the districts of the Wursten, Kedingen, and the marshy districts near the Weser, the Elbe, and the Northern and Baltic seas, which it may be proper to take some notice of.

This kind of sheep is by one half larger than the beforementioned kinds in Saxony. They have larger ears than the size of the body would make us expect; which are, besides, covered with short and strong hair; this sort of hair grows also on their
legs

legs (which, proportionally, are somewhat short), and on their heads, to the neck. They have horns, but not such as the mixed Saxon sheep have. Under the belly they have but little wool.

Besides the size and other qualities abovementioned, this Holstein breed differs from all the others in Germany, in respect to their tails, which are not covered with wool, but with short and strong hair; and not hanging down below the knees, but only as far as the middle of the thigh.

It is supposed that this larger species of sheep is descended from the mixture of a he-goat with a ewe; for it just fills up that space which lies between these two sorts of animals. To be convinced of this, we need only compare the size, shape, and tail of the Holstein kind, with the size, shape, and tail of the goat and the sheep.

The produce of a he-goat and a ewe will breed, as experience has shown; but it is remarkable that a ram with much more readiness crosses a she-goat, than a he-goat does a ewe.

The electoral Saxon minister of state, Count Einsiedel, made, at his country seat (Ehrenberg, near Waldheim), the experiment of crossing ewes from Eiderstadt in Holstein, with small fine woolled Spanish rams. His design was to produce a larger kind of fine woolled sheep.

The Holstein ewe in Ehrenberg, which was crossed by the Spanish ram, dropped two lambs

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(in Holstein the ewes sometimes drop three lambs at a birth) ; one of those lambs was a male, and the other a female.

The male lamb, when two years of age, was nearly of the same size as the dam, and had wool of almost an equal length. The female lamb, when two years of age, was much lighter, and shorter in bone than the male. Her wool was much finer, shorter, and more curled, than that of the male. In the size and quality of wool, she resembled more her sire than her dam ; but she was a little larger than the native lambs of her age commonly are. I have seen large sheep of the Eiderstadt breed, not only in Holstein and Ehrenberg, but also in Denmark, on the islands Femor, Laland, Fuhnen, and Jutland ; but in some places fuller of bone, in others lighter, and that, in proportion as the food they had received was more or less plentiful and nourishing.

These sheep are allowed to run about wild, without a shepherd, amongst bushes, or on fallows, and in large grass districts, which for their use have been inclosed, so that it is only when the snow lies very deep, that they are put into a kind of hovel, and are fed with hay and straw. During the rest of the winter, when the snow does not lie very deep, they live upon the branches of trees, or ling, or old dry grass, which they must seek for under the snow. Nay, often, they drop their lambs on the frozen ground, and I have never
heard

heard that any one of them has suffered or perished, by such an accident.

It is remarkable that the German breed with long tails, lose much of their native strength and vigour in those abovementioned islands and regions, and that the aforesaid larger sheep will not thrive in Saxony.

The larger kind want long and plentiful grass, and ling or heath ; but such food is not always to be had in Saxony ; for here, the sheep must, during the first part of the summer, feed in pastures which have been eaten off by other cattle, and which, therefore, produce but a scanty subsistence. When, therefore, the large sheep have pastured together with the small breed, on the same ground, and on grass of the above description, they have generally fallen off much, in flesh and bone ; their lungs and liver began to ulcerate, and thus many of them have perished, because their food had been too precarious, and not suitable to their constitution. On the contrary, had the very same sheep suffered no want of food, and been well kept during summer and winter, either in stables or without doors, they would have perfectly preserved their health and strength.

But as the large breed did not repay the trouble, which was necessary to keep them well, the farmers and breeders of sheep have resolved to give up the rearing of the large kind, finding that the smaller sort answers their expectations better.

There is still another sort of sheep, which is found in Lunenburg, a province belonging to the electorate of Hanover, and which differs from the common sheep in Saxony.

They are known under the name of Heyde Schmucken, and are remarkable for the smallness of their limbs and body. This breed live in a region, which is extremely barren, sandy, stony, desolate, and offering nothing but ling or heath; and here they must live during the summer and winter, without ever seeing a single blade of grass. In the latter part of the summer alone, they enjoy some compensation for their having endured that precarious mode of existence; for at this time, the ling is young, begins to blossom, and affords them such excellent food, that they become quite fat.

In size, this breed bears the same proportion to the ordinary sort in Saxony, as these do to those bred around Eiderstadt in Holstein. In other respects, this sort has a great resemblance to the Holstein breed; for they are horned, their horns rise above the head, and wind a little backwards; the head is covered over to the neck with little strong hair; the legs also are furnished with hair of the same kind; the ears are proportionally somewhat large; and under the belly there grows very little wool. They are born with tails so short, that they reach only as far as the middle of the thigh: they are, besides, covered, not with wool,
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but short and strong hair. Their tails, consequently, resemble perfectly those of the Holstein breed, with which the small breed, if we except its size, almost totally agrees.

From this strong resemblance of these two kinds of sheep, I believe it may be inferred, that, originally they were one and the same kind, and that the smaller one has shrunk into its present size, from want of proper food and attendance. For let any one try, and put a flock, or even a few sheep, formerly well fed and well kept, into a barren and sandy heath of the above description, and he will find that the sheep will decrease in size, each generation.

Q. 3. *What is the average weight of its whole carcass, the weight of its fore and hind quarter? the number of its ribs, &c.?*

Ans. A wether of the full growth, without skin or entrails, weighs, in a middle degree of fatness,

1. When of the mixed Saxon and Spanish kind,
40 to 50 lbs.
2. When of the large Holstein kind, 60 to
70 lbs.
3. When of the little Heyde Schmucken breed,
20 to 25 lbs.

In the highest degree of fatness,

A Saxon wether of the mixed kind weighs from
50 to 60 lbs.

A Holstein wether from 80 to 100 lbs.

A wether of the little Heyde Schmucken kind,
from 25 to 30 lbs.

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The number of the long ribs, which form the breast, and the belly, of these kinds of sheep, amounts to thirteen. The number of the short ribs near the kidneys amounts to four.

Q. 4. Is the mutton remarkable for flavour, goodness, or delicacy?

Ans. The mutton of meagre sheep is dry, and does not recommend itself by flavour; but that of a sheep well fatted is so juicy and delicate, that if not equal, it is at least not much inferior to venison.

The flavour of the mutton is less affected by the kind of food on which the sheep had lived, than is commonly imagined.

Q. 5. What is the average weight and value of its fleece?

Ans. The skin of a sheep of the Saxon sort, and without wool, is commonly sold for a mere trifle, because it is used only for parchment, and for lining the coats of poor people. Besides, when dressed, it has so little elasticity, that it is neither fit for gloves nor breeches. However, the price varies according to the quantity and quality of the wool found on such a skin.

Q. 6. What is the nature, length, colour, and price of wool? and for what purposes is it best calculated?

Ans. The wool of some sheep is fine, and of others coarse, as I have already described.

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The length of the wool depends upon the age of the sheep. A sound sheep never casts off its wool, as some animals do, at certain periods: on the contrary, we find that it grows from year to year longer and longer, as the hair on the head of man.

But if it should happen that a sheep really throws off its wool, we may be sure that this is a sign of a distemper, from which the sheep has recovered, and which either originated in a fever, or want of food.

The wool of a sheep, which has not been clipped for two or three years, grows so long, and becomes so heavy, that the animal can neither rise without difficulty from the ground, nor run any length of time without falling down from fatigue.

When a sheep is shorn once a year, then the length of coarse wool is from eight to nine inches, and that of the fine sort, from four to five inches. As to the colour, the wool is usually white, but sometimes speckled, and sometimes black.

The wool of a new-born black lamb is of a beautiful black colour, but when the lamb grows up, the fine black hue vanishes, and changes into a reddish colour, very similar to that of a fox.

We have no black sheep whose colour would remain unchanged, when exposed for some length of time to the beams of the sun.

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The coarse and long wool is worked into a strong and coarse stuff called baize or frieze, and into coarse stockings; the Spanish wool is manufactured into fine cloth; and of the fine and long wool of the Holstein sheep, fine stockings are made. A sort of stuff, called *serge de Nîmes*, is woven, and other textures lighter and thinner than cloth, but shining and glossy like silk. A pound of the finest wool of the mixed Spanish and Saxon sheep is sold for 18 gg.*

A pound of the Holstein or Eiderstadt fine long wool is sold for 12 gg.

And a pound of the coarse and common wool is sold for 4 gg.

But the price of wool rises and falls according to the state of the market, and the number of buyers and sellers.

Q. 7. In what age does the breed arrive at perfection? and what is the average quantity of its tallow when fat?

Ans. The breeds which I have described (*Ans. 1. and 2.*), arrive at their full size and perfection a year after they have lost the eight lamb-teeth with which they were born, and after they have got in their stead, other teeth; and this proceeds in the following manner: when two years of age they receive, in the place of the two-edged lamb-teeth in the middle of their jaw-bones, two broad ones.

* The mark gg. signifies *groshes*; one grosh, German currency, is about $1\frac{1}{8}d.$ English money.

ones. At their third year, they get again two broad teeth, on each side one. At their fourth year, another pair of broad teeth rise up, namely, on each side one: and at their fifth year, the two hindermost lamb-teeth fall out, and in their vacant places two broad ones immediately succeed.

After the sixth year, no sheep increases in size or perfection, but begins to decrease, and to decay.

They remain fruitful till the tenth or twelfth year, if well provided with food; but a sheep's age does not extend much above its twelfth or fifteenth year; and as early as its eighth or ninth year, it begins to lose its teeth from old age.

I have had sheep at fifteen years of age, who had not one single tooth left them, and who were, therefore, reduced to the necessity of chewing their food with the ridge of their jaw-bones. These sheep had lambed to their twelfth year.

But such an age and strength is the consequence of extraordinary health, plentiful food, and careful attendance.

When a sheep or wether has attained to the highest degree of fatness, the weight of its tallow or fat makes one-eighth of the weight of its flesh. In a middle degree of fatness, the weight of its tallow or fat amounts to one-twelfth of the weight of its flesh. But in a meagre state, its tallow is to its flesh, as one to twenty-four.

Q. 8. How many lambs does it drop at each birth? at what season of the year do they lamb? are the new-born lambs well covered with wool?

Ans. The sheep being tame and domesticated animals, have no time fixed for their propagation. They are at all times and seasons, fit and inclined to increase their species. But the rams in Germany are allowed to cross their ewes only in the autumn, in order to make them lamb in the spring, when the grass is tender and juicy.

The ewes are big with young during 150 days.

The common native sheep, and the mixed Spanish breed usually drop one lamb at a time. The Holstein or Eiderstadt kind produce two or three lambs at once. And in like manner the little Heyde Schmucken in Lunenburg bring forth two lambs at a birth, if they are well kept and well fed. The Spanish lambs as soon as they are born, have a sort of wool which is very short and curled; the lambs of other breeds are usually born with long wool of a common degree of fineness. We have no instance of their being lambed quite naked.

Q. 9. What is considered to be the best mode of managing the breed? what is their common food? and what sort of food seems best to agree with them?

Ans. The usual food for this species of animals, is hay and straw, of which the first must be perfectly dry, and the other not only dry, but also well

well thrashed. But this is food used in the winter only. The best food that can be given in the summer is clover, and herbs growing on dry ground, and short grass on hilly regions, as well on heath as on sandy districts; whereas coarse and rank grass growing under shade, and in a moist ground, or that has been overflowed by an adjoining river, ought to be carefully avoided; because such grass is seldom found, and always, when dried for hay, dangerous to the health of sheep.

Q. 10. To what sorts of diseases is the breed particularly subject? and how can they best be prevented and cured?

Ans. A particular kind of disease to which our sheep are subject, is that which we call the *turning*, or *the becoming stupid*. The reason of this strange appellation lies in the effect of the disease; for those sheep which are said to turn, or to become stupid, incline their heads towards one side, and turn their body at the same time round, in a circle.

The disease itself originates in a blister of water lying sometimes between the brain and the skull, and sometimes between the cells which inclose the marrow. When the blister was seated between the brain and the skull, the trepan or a sucking instrument has been used with much success. But when the blister lay between the two

cells, it could not be taken out without hurting the brain, and killing the animal.

Other remedies, besides what I have mentioned, are not known, at least to me.

However, this disease extends to young sheep only, which are about one year old, and very seldom to sheep of two or three years old.

This distemper prevails not in all our flocks in an equal degree: nor does it make its appearance every year. Some provinces have, therefore, been for some time quite free from it; whilst others have lost in a flock of one hundred head, ten lambs in a year, others only three, and others only one out of five hundred.

This disease is more frequent where the pastures are full of fine grass, than where heath only is growing. Hence it is, that the little Heyde Schmucken in Lunenburg are very seldom affected with it, and that often, one thousand of them reach the end of their first year, without being attacked by any thing like the above disease. And when it does happen to prevail amongst them, not above one perhaps in a thousand is lost.

It has been observed, that lambs produced by a ewe belonging to a flock where this disease is not quite unknown, and by a ram taken from another flock, where this distemper is more prevalent, have under these circumstances shewn stronger symptoms

symptoms of their being infected with that sort of madness, than under any other. From hence, I believe, it may be concluded that the turning or becoming stupid is an illness that may be propagated from the fires to their offspring.

There is another distemper to which our sheep are liable, and which is also propagated from one generation to another. It consists in this, that the sheep afflicted with it has got a stiff hinder leg, and reels in moving forward, as if its back was broken. In this state it usually bites its own hinder legs, and tears off from them the hair, together with the skin. Its strength abates, its flesh becomes from time to time more meagre, till at last it cannot any longer keep up with the rest of the flock, and remaining behind, falls on the ground and perishes.

The cause of this disease seems to be a gouty matter.

I had once bought some rams which belonged to a breed, where this disease had gained great influence. Knowing nothing about this circumstance, I put those rams to my ewes, without any apprehension of danger; but ere long I got acquainted not only with the name, but also with the nature of this dangerous distemper.

Soon after this accident, it happened, I know not how, that some rams of my flock got admittance into the flocks of a farmer, and it was observable

fervable in a little time that they had introduced into those flocks the same disease, with all its fatal consequences, though it was before that time never known in that farm.

To rescue my sheep from so destructive an enemy, I tried, after some years, to incorporate with my flocks sound and strong rams, taken from a herd perfectly free from this disease; and I am happy to say, that by this means the evil gradually diminished, so as to leave no trace behind it. The same remedy was applied by other farmers, and their flocks were likewise restored to health.

To sheep, thus diseased, half or one ounce of *bella donna* leaves will afford great relief, provided that portion be given them, one day after another without interruption, and as soon as symptoms announce the approach of the disease.

Another distemper, which concerns more the lambs than the sheep, is the making blood instead of water. It is contracted when the lambs feed on pastures which are very fat, or on a ground which produces wild clover, especially of the red kind, more particularly when the weather is moist, and the leaves and stalks of the clover and grass are very juicy and tender. But if the weather is dry, the distemper is less frequent, and if the ground is sandy and meagre, it is scarcely known at all. Even red clover and juicy grass become less hurtful, when both are mixed with grass that is dry and less juicy; or at least when,
after

after the first, the second is given, and this change of food is kept up as long and as often as there is ground to provide against the evil.

The lambs usually die of this disease in twelve hours, or after one, two, or three days; which is also the case with old sheep, when they labour under spasms or the gout, and at last happen to fall into the same disease. But they die in great agonies, violently extending and contracting their belly by turns, and crooking their back.

As soon as any pasture ground contains marks of its producing red clover, nothing is more advisable than to keep off the sheep from such ground; and in case they have been, or still are, upon it, to turn them directly from it, into meagre grass districts. By so doing the distemper either will be prevented, or in case it has got an entrance, it will be stopped in its progress, and by degrees disappear, without infecting any of the sound sheep.

Those sheep which suffer by this distemper may be relieved from their spasms, and soon restored to health, by taking one or two grains of opium, mixed with a little saltpetre.

A very dangerous disease which threatens these animals, is the colic or inflammation of the entrails, which often kills them in six hours, and from which they seldom recover, without the assistance of art. As soon as this disease appears, either

either clysters must be used, or a vein opened on the forehead.

It is remarkable, that the flocks turned into sandy and poor grafs plains, remain perfectly free from this distemper, and that only those which live upon rich and juicy grafs are particularly exposed to it.

The small-pox is another known and contagious distemper, which may become very dangerous when sheep are shut up in narrow stables, and by all fresh air being excluded, they are forced to perspire in a violent manner. Though it may be granted that the design of this practice is beneficial, and that the sweat thus forced may facilitate the breaking out of the small-pox; yet it has been found, that by such a mode of heating the blood, one-third or one-fourth of the flock has been killed; whereas, when nature was allowed to take its own course, and the sheep were kept neither too warm nor too cold, the loss has not exceeded eight per cent. especially when good food and water was provided for them.

The scab does not kill; it is not propagated by inheritance; and the distinction made between sheep born scabby, and not scabby, is void of foundation; for none are lambred scabby.

There is a sort of scab more violent than the first. We call it *grind*, and believe that ill treatment or hunger is its usual cause. For any animal,

animal, when exposed to the pains of hunger, or deprived of what nature demands, will change its state of health, and commonly become scabby.

To keep the sheep free from the *grind*, nothing has proved to be more effectual than to feed the ewes well, that they may produce sound lambs, and to take care that both ewes and lambs are not distressed with hunger; for if we do not neglect to follow this rule, our lambs will get sufficient milk, they advance without interruption in growth, and in the autumn enter their stables with full health and strength: and if they are treated with the same care during winter, we are quite sure that the *grind* will keep at a distance, and that they will leave their stables again in good health. To give them, at one time food in plenty, and nothing afterwards for some hours, is a pernicious practice, which never fails to introduce the scab, or the *grind*.

The scab is contagious, as well as the *grind*, but not to such a degree, as to infect sound flocks when they merely pass through scabby flocks.

The scab is best cured by giving better food than usual. A salve composed of turpentine and a little tallow, when applied to the scabby places has also good effects.

But the cure has been performed with greater dispatch, when *extractus saturni* well thinned is used.

Another very dangerous disease is apt to arise, when the lungs begin to rot, or when ulcers attack both the liver and lungs, and produce worms in the vessels. Such symptoms usually terminate in a dropfy, either in the belly or the breast; and if the last takes place, the sheep is past cure.

Salt is a good remedy against the worms in the liver, and when given once or twice a week, has been found to stop the increase of these dangerous reptiles. The rotting of the lungs and liver may be prevented by avoiding those sorts of food which I have pointed out, at No. 9, as hurtful.

Q. 11. Have any means been discovered to improve the fleece either in quantity or quality? and which of them have proved most successful?

Ans. This question has been already answered at No. 1. and 2. where I have shewn by what means I have improved the coarse wool of my own sheep, and how I have raised it to such a degree of fineness, as to render it perfectly equal to Spanish wool.

But not only coarse wool may be changed into fine wool; it is also possible to reduce fine curled wool into coarse, long, and loose wool.

The quality of wool seems to depend upon descent, and the quantity of it upon food. Hence a sheep, when fed during the year with so sparing a hand, as just to be able to support its life,
brings

brings only half the weight of wool, which the very same sheep would have produced, if its food had been more plentiful.

The most advantageous mode which I know of, for improving the wool to a desired degree of fineness, is to put such rams to the ewes as possess that fineness of wool, which we wish to transfer to our flocks.

The more perfect the rams are, which we have procured for our flocks, the more quickly will that improvement go on. Nature does not always accommodate herself to the rapid progress which our expectations of her liberality often anticipate; yet it has been confirmed by experience, that she seldom departs from the following proportions:

Suppose the ram, whose fineness of wool we wish to incorporate with our flocks, to be designated by the figure 1. and the ewe which we unite to the ram to be denoted by the sign 0. Now, as the sire is equally necessary with the dam to produce a lamb, it follows that the lamb will participate of one half of the qualities of the sire, and one half of the qualities of the dam; the lamb consequently will be related to its sire as $1 + 0 = \frac{1}{2}$; that is to say, it will share in one half of the qualities of the sire.

Further, in the second generation let the ram remain 1. and the lamb produced from the first generation let remain in its qualities half; it follows,

that the lamb produced from $1 + \frac{1}{2}$ shall be equal to three-fourths of the qualities of the fire.

Let the ram for the third generation be again 1. and the ewe to be crossed by it remain three-fourths, and the offspring of this couple shall possess seven-eighths of the qualities of its fire.

Finally, let the ram for the fourth generation be 1. and the ewe to be put to the ram, be seven-eighths; it follows that the lamb from the fourth generation shall partake fifteen-sixteenths of the qualities of its fire, and almost equal him. It may be easily perceived, that shepherds, by following up these rules, which depend on the unalterable laws of nature, may approximate their wool to that fineness which they would have it attain. Nature, it is true, advances sometimes forward or goes backward contrary to our expectation, yet on the whole she remains faithful to her proceedings. The following rules may, in general, be relied on with safety.

1. He that would improve the fineness of his wool, must endeavour to get as fine rams as possible, more especially for the first generation; for it is evident from what has been above stated, that if the first ram is not so valuable as the second, the improvement must of course advance more slowly.

2. That the wool improves in fineness, in the same proportion as the wool is finer which the ewe of the first generation possesses.

3. The

3. That care ought to be taken not to admit a ram for the subsequent generations, whose wool is not equally fine with the first ram. If that should happen, every one must see, that by such an accident, the progress towards refinement must either be stopped, or at least greatly retarded.

4. In case the breeder does not wish that his wool should possess the highest degree of fineness, but only half or three-fourths of it, he can easily accomplish his desire. For he need only take a ram from the first generation one half, and a ewe from the same generation one half; or a ram from the second generation, three-fourths, and a ewe from the same generation, three-fourths, and the improvement of the fleece shall stop, so that there will be no change either from better to worse, or from worse to better.

5. But if the breeder is not attentive enough to this particular, and puts a ewe which was used *for* the first generation, or a ewe of the same coarseness of wool with her, to a ram *from* the first generation, and consequently puts 0 to $\frac{1}{2}$, it naturally may be inferred, that the lamb produced by this couple, shall have only one-fourth of the fineness of his sire's wool.

If a shepherd puts a ram from this generation = $\frac{1}{4}$ to a ewe = 0, the lamb will inherit of its original sire's qualities, no more than one-eighth. In such a case, the line drawn between the sorts, to which
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the ram and the ewe belong, becomes gradually more prominent, and the two breeds which were intended to melt together in their properties, begin to separate and to return to their former state. And when this happens, it is not uncommon to hear the unexperienced multitude talk in the following manner: it is impossible to improve our wool—we have done and tried all we could. At the first sight it seemed as if it would answer, but we now find by experience that it will not succeed. Our wool at first improved, but not for any length of time; it soon returned to its former coarseness. Our pastures are so bad, that they cannot answer the purpose. They are too hard, too weak, too sour, and too sweet, and so forth. We have not hay enough, its quality is execrable, and how can straw produce fine wool? It is in vain to talk from books. The learned may keep their Latin husbandry to themselves; we know the thing better from experience. Juicy clover, nutritive grass, either on plains or hills, and attention to the proper mode of treating this species of domestic animals, will improve more effectually the fineness of the wool, than all the book learning in the universe.

But however important this practical wisdom may appear, nothing is more certain than, that no sort of wool can be improved, without the methods abovementioned, and that no regular progress in improvement is practicable, without applying

applying those methods with as much accuracy and constancy as possible.

Food has no manner of influence on the quality or fineness of the wool. The quality which we discover in the wool of one flock is an essential and distinguishing mark of it from other flocks. It remains unalterable in all subsequent generations, provided no faults are committed on the part of the breeder, which have tendency to render it worse. The quantity of wool depends entirely upon the quantity and nature of food.

If a flock be allowed to suffer hunger, a natural consequence will be, the wool stops in growth, it loses its softness, melts as it were together in clusters, and becomes less useful.

Let any one clip off the bad wool, then feed the animal plentifully, and it will produce more useful wool, which has natural elasticity.

A breeder who would give his wool only a certain and fixed degree of fineness, such as one half or three-fourths, or seven-eighths in the fineness of the ram, may, if he like it, turn fine wool into more coarse, by putting a ram of one half to a ewe of one half, or a ram of three-fourths to a ewe of three-fourths, or a ram of seven-eighths to a ewe of seven-eighths.

Sometimes nature, as I have already observed, seems to diverge from her usual course, and the fleece turns out to be either a little finer or coarser

fer than was expected, but this she does only occasionally, and it is far from being general. A new born lamb displays no marks of the fineness to which its fleece shall attain in process of time; and no less than a whole year must have passed, before it is possible to decide that point with any degree of certainty.

Some have a rule, to breed no more lambs for rams than are absolutely necessary to propagate their flocks. But this custom has a tendency, I will not say to retard improvement, but to make it retrograde. For if there are no more rams reared than are absolutely necessary, it will often happen, that among those rams there are some, whose wool is of a lower degree of fineness than was expected. If this take place even in regard to one, the consequences may easily be foreseen.

Those, therefore, who would wish to avoid such disappointments, will bring up twice or thrice as many rams for their flocks, as are absolutely necessary; for, by so doing, he procures himself the liberty of selecting such as will answer best his purpose. And as this double or treble number of rams are to be kept only till they are one year old, he may, after the selection, get the rest castrated. If this remark be duly attended to, there is as little probability that the wool of the flocks in Germany, or more northern provinces, should degenerate from the excellence of its quality, than there is for believing that the flocks of Spain shall cease
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to propagate the qualities of their fleece. Indeed, were the Spanish breeders themselves to cease selecting for their ewes the most proper rams, or even neglect to do so with their usual care and accuracy, nothing can be more certain, than that those famous flocks would soon sink into contempt.

In Spain but few lambs of the fine wandering herds are castrated, and these are called tame lambs, because they answer the voice of the shepherd, by coming when they are called, and for this reason they are used to lead the flocks. All other male lambs remain rams, and hence it is easy for the breeder to select such of them as are apt to propagate the same fineness of wool, and to preserve its fame.

Q. 12. How often in a year are the sheep shorn? is there any difference of weight and quality, in the summer and winter wool?

Ans. As to the time when, and how often, the German sheep are shorn, it is commonly once a year, and that either at the end of May or the beginning of June. The fineness or coarseness of the wool makes no alteration in this rule.

In other provinces the sheep of the same quality are clipped twice a year; the first time at the end of April or the beginning of May, and the second time at the end of August or the beginning of September. The quantity of the wool

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clipped

clipped at the first period is greater than that clipped the second time; because the first wool has been allowed to grow seven months, and the second only five.

The weight of wool has been found to keep pace with the quantity and quality of the food. A sheep which has got no more, and no better food than was indispensably necessary to preserve its life, produces only two pounds of wool in a year; but, give the very same sheep, in the succeeding year, plenty of good food, so that it fattens, and the weight of its wool will increase to four pounds.

If we consider only those sheep which are neither quite fat, nor quite meagre, but in a state between these extremes, the produce of wool in Germany, on an average, may be estimated in the following manner.

A suckling ewe of the mixed Spanish and Saxon breed, with a long tail, commonly gives in a year, of wool, about $2\frac{1}{2}$ lbs. A ram of the same breed and description, 4 lbs.

A large suckling ewe of the Holstein breed, in the marshes, with a short tail, 4 lbs. A ram of the same kind 7 lbs.

A suckling ewe of the little Heyde-Schmucken, $1\frac{1}{4}$ to $1\frac{1}{2}$ lbs. A ram of the same race 2 lbs.

The reason why the same kind of sheep is clipped in one region twice, and in another only once a year, is, because the breeders wish to
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sell off their wool in the easiest and most advantageous manner, without being at the expence of exportation. For if there are wool manufacturers or buyers in the neighbourhood, who desire short and fine wool, the sheep are clipped twice a year; but if such manufacturers or buyers desire a long and fine sort of wool, the breeders accommodate themselves to their wishes, and clip their flocks once a year.

But to preserve the health of the flocks, it is, I think, more adviseable to clip them only once a year, and that in the middle of the summer. The weather in autumn is very unsettled, at one time very cold, at another very warm; and to strip the sheep in this season of their wool, is to deprive them of the comfortable garments which nature gave them as a covering, against the inclemency of the weather. Besides, these animals, when their naked skin is exposed to cold rain, commonly lose their appetite for food, shrink into a melancholy posture, and endeavour to creep into holes, either under trees, or in buildings, and very evidently decrease in flesh. However, it must be allowed, that by clipping a sheep twice a year, one-tenth more wool is gained, than by clipping it only once. The reason appears to be, because the wool never grows more quickly than at the time when it has been shorn.

A sheep clipped once in two years will certainly give one-third less wool, than if it had

been clipped four times in two years; and a sheep shorn once in three years will furnish but half the wool it would have given, if it had been clipped six times in three years.

The longer the wool, the less quickly it grows, till at last when it has attained the length appointed by nature, it entirely stops, and does not grow any longer.

(SWEDEN.)

(SWEDEN.)

Observations on Sheep, particularly those of Sweden. Translated from the Communications of Baron David Schulz de Schulzenheim, a Foreign Honorary Member of the Board of Agriculture.

CHARLES the Ninth brought over to Sweden a German shepherd, with 100 German sheep; and a further amelioration of the breed of sheep was projected in the reign of Gustavus Adolphus, and of queen Christina. But it is to a later period that we must more particularly ascribe the honour of having promoted with activity the improvement of sheep-farming. By the endeavours of the late Sir Jonas Alströmer (counsellor of commerce, and knight of the order of Vasa), that most zealous improver of the breed of sheep, there was established in the year 1739, near Alingsås, a school for shepherds, with a salary for a master shepherd brought from abroad. The same gentleman had already procured, in 1715, some fine woolled English sheep; in 1723 some Spanish, and in 1726 some from Eiderstadt. Provincial shepherds

shepherds, instructed by the master shepherd, and lecturer, on political economy at Alingsfos, were ordered for each county: but as the employment of persons of this profession, though but ill paid, came, in the long run, to fall heavy on the public; and at the same time tended to introduce into the management of sheep refinements which the simplicity of nature does not require, an end was put, in the year 1766, not without reason, to this shepherd establishment, which had perhaps, at its original commencement, been useful.

In the year 1741 premiums began to be distributed for the best breeding rams of the Spanish and English race, which were sold to the country people. The peasants were, besides this, encouraged by rewards given for good breeds of sheep. From the last mentioned year to the year 1780, there were distributed premiums of 25 per cent. on the value of genuine Spanish, English, and Eiderstadtish wool, sold to the woollen manufacturers; on which account there were also employed certain appraisers, who were paid at the wool warehouses of the Board of Manufactures. From the Transactions of the Royal College of Commerce it appears, that from 1750 to 1760 the annual importation was already at a medium, 4,468 pounds less than during the ten preceding years, although the manufacturing of cloth had rather increased, and foreign cloths could only
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be got into the country by means of smuggling. In 1781, the premiums were lowered to 15 per cent. and in 1786 to 12 per cent. The premiums on wool were paid till the beginning of the *Realisation*, in 1776, in dollars copper, which, with a variation in the course of exchange during those years, from 36 to 72 marks and upwards, might at an average be reckoned at 54 marks to a rix-dollar, in specie: and the sum total of the premiums distributed during forty years, amounts in Swedish rix-dollars, to 235,575, 47s. 4r.*

During the above forty years, the cloth manufacturers are known to have received, at a medium, a yearly supply of fine wool of home production, which passed through the wool warehouses of the Board of Manufactures, of 85,074 pounds; foreign fine wool imported, 65,576 pounds, making together, 150,650 pounds. But if the amount of the home and foreign finer wool be reckoned only for the last twenty years, the annual average arises to 186,232 pounds. The premium wool of home production has, during the last ten years, considerably exceeded the quantity of foreign fine wool imported. And that the quantity of home-bred fine wool from the fine woolled Spanish race is perceived to be smaller in the table for the year 1789 and 1790, by no means

* Equal to £54,626. 6s. sterling, reckoning the intrinsic value of bullion.

means proves any diminution of the stocks of sheep; for since the wool in the wool warehouses was merely appraised at about half of what the manufacturers paid for it, and since the premiums were not only lowered to 12 per cent. but also during the last three years were not paid ready money, the sheep farmers came more than formerly to sell their fine wool directly to the manufacturers, without depositing it in the wool warehouses; that round about way, being besides attended at all times with difficulty and loss of time to the country people who live at a great distance. Some persons also cause cloths to be worked out of their wool by the manufacturer, on their own account, paying for the labour; and besides, people are become more expert in private houses in the art of spinning fine wool.

As the Board of Manufacturers can only state the amount of the premium wool which has been appraised and sold in their warehouses, it is scarcely possible to fix the precise quantity of the fine wool of the Spanish kind produced in this country. According to the report made by the provincial shepherds, there were in the kingdom in 1764, 88,750 genuine fine woolled sheep, without counting 23,384 good sheep of mixed breeds. If perfect credit could be given to the first of these numbers, it would give room to conjecture, that in the above year there was in the country a stock of 266,259 lbs. of fine wool. The annual
fleece

fleece of each Spanish sheep may reasonably be reckoned at 3 pounds, without adding to it the wool of the belly and legs, which however the manufacturers are accustomed to let pass at the same price with the rest, when it is found to be well washed. How much ought to be deducted from the quantity stated, on account of dirtiness, it is equally impossible to determine, as many people neither wash the Spanish species of wool before nor after the shearing, so that the proportion may vary from 20 to 50 per cent.

The specification of the several quantities of wool which are deposited every year in the public warehouses, does not prove with certainty the number of sheep farms, since certain housekeepers who live at a distance from the Board of Manufactures, sometimes lay up their wool during two years; and others who live nearer, now and then send their wool, in separate parcels, for each of which they receive different *numeros*. Commonly, large flocks of sheep are not kept on each farm: for though several hundred sheep are kept through the winter on certain gentlemen's estates, which together may form about one-eighteenth part of the 80,713 farms (*hemmantal*) older and newer, which our country is supposed to contain; yet on the greater number there are maintained only about fifty head, and often much fewer. It is beyond all doubt that the race of fine-woolled sheep has annually increased in this country, since the ad-

vantages thereof came to be better known, and since the management of them has been remarkably simplified. It is also not to be denied, that the public encouragements for the propagation of the Spanish race of sheep have been carried among us to the greatest height. Yet at the same time, there is no danger of the foreign races disappearing, together with the premiums, which would be the case with many other costly and brilliant establishments.

Our demand for foreign, Spanish, and Portuguese wool is probably at present still greater, than the importation in the table for the year 1789 and 1790 seems to indicate. The Swedish navigation was at that time cramped by the disturbances of war, and the manufacturers could hardly employ themselves in any thing else than weaving by commission. On the other hand, the extraordinary great importation of fine wool in 1778, and the years about that period, may be attributed to the change of the Swedish dress, and the fall in the price of Spanish wool, during the English war. A great part, however, of the Spanish wool here mentioned is by no means of the finest sorts; for instance, *Caceres*, or *Estremaduran*, *Andalusian*, and *Portuguese* wool, and several *Lanas Churras*, as they are called. It is the *Segovian*, and particularly the genuine *Leonese* wools, which, however, are usually comprehended under the name of *Pilas*, *Leonesas*, *Segovianas*, which

which give to cloth the distinguished softness, on which the courtier sets so great a value. The so perfectly fine Spanish cloth, which has the softness of velvet and satin, and which we generally see come in presents to other countries, is not worked from the wool of Spanish sheep, but from the wool taken from the Peruvian Vigogna, Lama, or Alpaca (*camellus glama et pacos Linnæi*), which is of the camel species, and which will scarcely (it is probable) be introduced into Europe, though it should seem that, they ought to thrive equally well on the Spanish, as on the Peruvian mountains, which are still higher, and covered with snow. Vigogna or Vicugna cloths, however, are said to be frequently adulterated by a mixture of sheep's wool, or beaver.

It appears from the public accounts, that the importation of foreign coarse wool has during the last years decreased, and consequently the coarser species of sheep in the country, far from falling off, have rather, during the importation of the fine woolled Spanish race, been gradually multiplied, as the consumption, together with the progress of population, must have increased. Our manufacturers work coarse articles for the most part of foreign wool. The degree to which clothiers, stuff-workers, hat-makers, and different other workmen are furnished with coarse wool of home production is inconsiderable: this our inhabitants must themselves use. During the last

war, when an extraordinary quantity of commission goods were worked, the importation of coarse wool might have been conjectured to be greater than the preceding years; but that the case was otherwise, proceeds from this, that the stuff manufactures fell into decay, in consequence of the people having begun to use silk and cotton articles for under garments, and lining for clothes. There is also a greater quantity of English woollens imported by smugglers at present, than formerly.

An examination of our public accounts, would also ascertain to what towns in this wide extended kingdom, and from what places, the finer, as well as the coarser foreign wool has been imported. The Polish and Lithuanian wool, which is brought here from Dantzic and Königsberg, forms, among the coarser sorts of wool, the greatest quantity. An attempt has also been made, by means of premiums of twelve per cent. to encourage the Polish race of sheep; but very few persons have found their account in it. Besides the inconsiderable importation of Russian wool, which has a great resemblance to the Polish, there are also imported, for the purpose of furs, skins of black lambs, taken either before they are lambled, or immediately after. It is beyond all doubt, that the good management of sheep is carried the furthest in the southern part of Sweden, or what is called the kingdom of Gothland. But Stockholm, although situated in Upper Sweden, draws to itself, as the capital

capital of the kingdom, the greatest quantity both of home and foreign fine and coarse wool. The public warehouse at Norrköping has, however, some years received for appraisement more premium wool of home production, than the warehouse of Stockholm.

The total number of the Swedish breed of sheep, cannot be otherwise stated than according to probability. To provide our nearly 2,800,000 inhabitants, older and younger, annually, with the necessary wool, it would seem that at least three marks* for each person, or the fleece of an old sheep, with a proportional addition of the wool of the increasing race of lambs, is necessary. Now, if 2,800,000 full grown, more or less woolly sheep, together with the year's lambs, are supposed to yield at an average three marks of wool, there results from thence a

quantity of	-	-	8,400,000 lbs.
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From which is to be subtracted the medium importation for the last 20 years, of Spanish fine wool

-	-	-	64,947
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Also the average of foreign coarse wool, imported during the same period, viz. 30,705² stone, or

-	-	-	614,108
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			679,055 lbs.
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There remains	-		7,720,945 lbs.
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* A mark is much the same as a pound.

This balance gives room to conjecture, that there are now maintained during the winter, in Sweden and Finland, 2,573,648 sheep (not reckoning the additional lambs of the year) or 31 or 32 sheep at an average on each farm. On certain gentlemen's estates, with their dependent cottage-farms, as also in those provinces, which are provided with good pastures and abundant hay, a greater number of sheep are kept upon each farm; but this must take place in a less degree, where the ground is overgrown with wood, or marshy: and in a land so unequally cultivated, and which stretches from the 55th to the 70th degree of latitude, no perfect uniformity in this case can take place; but if the breed of sheep continue to be augmented in the same progression, in a few years, Sweden, which is at least six times as large as England, so famed for her profitable sheep, must be able to do more than supply her own wants, with almost as good kinds of wool as the Spanish, and likewise with the coarser kinds resembling the German and the Polish. In the whole of Great Britain, there are maintained, it is supposed, at present, 28,800,000 sheep, which together with 2,037,000 lbs. of Spanish wool, the medium importation into that country, must give an annual stock of nearly $88\frac{1}{2}$ millions of pounds of wool. This quantity again divided among eight millions of people, would amount to above 11 marks

marks of wool a man; but at this rate it would appear, that hardly one-third part of the woollen manufactures remains in the country.*

Of the farms above stated, which supply the Swedish cloth manufacturer with premium wool of home production, of the Spanish kind, there may be two belonging to the writer of this paper. At the one of these, a race of Spanish sheep, of near fifty years standing, is kept. I have six different times brought from Spain, both rams and ewes, with a view, if possible, further to ameliorate the Spanish breed of sheep already on the spot. I had also of late years an excellent opportunity, by means of a friend and relation resident in that country: but as a proof that even in the Spanish province, noted for the breed of sheep, real fine woolled sheep are not so common, I must mention that of six different cargoes, consisting of Leoneese and Old Castile sheep, procured with great pains, not more than a single one, which arrived here in the year 1778, surpassed the former race. All the others were far below comparison with them; on which account also, the appraisers at the public hall strongly dissuaded all mixture of the four latter parcels of Spanish rams and ewes, with my former stock. What value
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* Wool is made use of for various other purposes in England besides that of cloth, by which immense quantities are consumed, as in carpets, upholstery, saddlery, in articles for carriages, &c.

is put in Spain itself on a choice ram, appears by this, that for such a one, according to Baron Clas. Alstromer's ocular evidence, a curious sheep-farmer in the country will pay as high as 100 Spanish ducats.

The capital sort, which arrived in 1778, was of the Leoneſe ſtock, which I alſo think has the preference over the much renowned Caſtilian race, from Segovia, Soria, and Burgos. The wool of the above ſheep was of the ſort, which the Engliſh call *clothing wool*, which is very ſoft, greaſy, curly or rather wavy, thick matted together at the top, and is preferred by the clothiers, becauſe it *felts* better, and makes a finer cloth, than the ſort which is dry, hairy, pointed at the extremities, buſhy, and commonly longer and thinner. The wool of the leſs fortunate cargoes of Spaniſh ſheep, reſembled more the laſt deſcribed, or Andaluſian ſpecies, though conſiderably finer than the Barbary, Roman, or Engliſh ſorts of wool, which are called *combing wools*. The laſt mentioned ſheep were larger, and eſpecially longer legged than the Leoneſe, but gave a much ſmaller produce than their buſhy and upſtanding wool ſeemed to promiſe. The Leoneſe breed, which I imported, have alſo a pretty ſtout trunk or body, which is covered with a thick wool, quite down to the legs, which are very ſhort. As a mark that their deſcendants were of the genuine race, I obſerved, beſides the ſoftneſs
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and abundance of their wool, that half of their ears were brown, like the first stock. The Leoneſe ewes alſo lived to ſee five generations in lineal deſcent from themſelves, of which none have degenerated in point of fineneſs of wool, upon the moſt accurate compariſon. The wool from the above two farms, is now reckoned of the firſt quality of Spaniſh wool of home production, in the public warehouse at Stockholm. It is divided, with a view to the appraiſement, in the Spaniſh manner, into 1ſt, 2d, 3d ſort; but it has for ſeveral years, without counting the per cent. premiums, fetched from the manufacturers, one ſort with another, twenty-four ſkillings (half a rix dollar), and twenty-four ſkillings eight *rundſtycke*, and laſt year thirty-four ſkillings.* The purchaſers themſelves likewiſe own, that they ſeldom get wool from Spain, that is equal in quality to that of my breed of ſheep.

With regard to food for ſheep, it has been found here, as it has been found in ſome other places, that the moſt proper paſture, is the fallow fields in ſummer, and the ſtubble fields in autumn. The idea of ſome people, that rich paſture is not the moſt proper for fine woolled ſheep, is certainly ill-founded. Different kinds of *trifolium*, *medicago*, *lotus*, *vicia*, together with other *diadelphists*, which grow in abundance

* Intrinſically equal to three ſhillings and four pence ſterling.

dance in the fields, form their most favourite food, provided the growth of these plants be not too rank. The objection that sheep are more apt to dirty themselves on summer fallow is unimportant when applied to the best Spanish breed; for their wool, matted at the points, is covered over, and stuck together as it were with a varnish, by means of which the interior wool preserves all its cleanness, and its white colour, which only acquires somewhat of a yellowish cast from its greasiness. On the outside, the choicest sheep appear as if they were done over with a dark brown paste, and they can thus be separated, at first sight, by a person of skill, from the inferior kinds, which are whiter on the outside. Although an industrious farmer does not leave broad headlands in his fields, and cleans his ditches frequently, yet in this country there are considerable hills on almost every farm. Sheep are also much accustomed to feed upon the tender and rich weeds which they pick from the fallow, which, at the same time, they manure. If the summer fallow is not sufficient for pasture, high lying grass inclosures are chosen for that purpose; and though the situation of our country is subject to various inconveniencies, yet our woods give us easy opportunities, by means of palings, to make many separations; so that we are under the necessity of having recourse to commons, and heaths for sheep pasture, by which the breeds are apt to be mixed. Shepherds and dogs are for the same

same reason unnecessary with us in Upper Sweden : and though the grass in the inclosures be not at first of the choicest quality, it quickly improves, when sheep pasture in them for any time : and besides, they eat with great eagerness certain less noticed grasses, such as the *festuca ovina Linnæi*, which grow on the sharpest and most meagre hills. Trees of those kinds, which are apt to soil the wool, are generally destroyed in their pasture grounds ; but shady, leafy trees are the more useful, as a scorching heat hurts the sheep more than cold, and even wet. For the most part too, the pasture grounds are situated so near the farm offices, that the sheep at the approach of a heavy rain may quickly be driven home ; and in other places sheds are constructed to afford them shelter. In case of a continued rain, a careful sheep farmer also prefers foddering his sheep in the house, particularly soon after the shearing, when they are more delicate. Some persons fold their sheep all night on the summer fallow, for the sake of manuring it ; but it is always better, for fear of bad weather and wild beasts, to drive them home every evening. If there is not running water, or good springs in the pasture ground, it is so much the more necessary to drive the sheep home, for the sake of watering them at the lakes or wells, which in this country are seldom wanting near the farm houses, because their disorders in the stomach,

and worms in the intestines, mostly proceed from their drinking stagnated water.

For winter food, hay well got in on dry fields, or upland hay, is always chosen, and the greatest quantity of fodder ought to be at the rate of three marks a day for each sheep, reckoning the yearling lambs; this fodder (which should be measured out in baskets) for *seven months, during which time our sheep must be kept within doors*, makes thirty-one and a half stones (of 20 lbs.), or a good load of hay. When one meal is given of leaves, and another of the straw of spring corn or peas, from a third part, to the half of the hay, may be deducted. Of the leaf kind the fallow, the willow, the ozier, the maple (*acer plantanoides*), and the birch, are the best for feeding sheep. On the other hand, inquiry is wanting how far the alder and the oak are inferior, and whether the aspen, which they so eagerly devour, is always hurtful, as our experienced cultivator, Charles Gustavus Boje, was inclined to maintain. Some persons, besides a sufficient quantity of hay, spend yearly from a quarter to half a barrel of oats on each sheep: but my breed has not altered, although they never have had this costly food. It is received as an incontrovertible truth, that the better sheep are fed with hay, the more surely, the breed is preserved in its primitive goodness; but experience is thought at the same time to prove, that well got spring corn straw,
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can pretty well supply the want of hay, when the sheep at the same time get a little refuse of corn and chaff. Other cultivators, on the flat grounds of Upland, who have but a small extent of grass land, have fed sheep with singular advantage on straw with grains, and thus derived an unknown profit from the distillery of spirits, which in other points of view, must be looked upon as the most destructive of all human inventions, and which was the principal cause that we, in the course of the last ten years, from 1781 to 1790, at an annual medium, imported 762,672 barrels of different kinds of corn.

Fodder is usually given out of racks; but it is necessary, that the hay be not put into them, when the sheep are in the house, and also that the bars be close, and stand quite upright, if we wish to prevent the wool from being soiled by the dust. I have also found, that the fodder may be strewed equally well on the floor, according to the peasant's method, by which means, the dust does not fall on the wool, neither is any thing left uneaten. Some persons let out their sheep to water only every third day in winter; but with me, they are let out to water, in the coldest season, with the greatest advantage, twice a day; by which means, they only drink moderately, and at the same time take a degree of exercise, which is requisite at all seasons. The thick woolled Spanish sheep must indeed feel less cold, than
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the thin woolled and more naked Swedish breed. The sheep houses may be aired and cleaned, while the sheep are out : the refuse of straw is by that opportunity spread on the floor, and over it new fodder. Towards spring it is useful to lay out twigs of pine and juniper in the farm yard, which serve in some degree for food, but still more as a remedy for the scurvy contracted during the winter ; and there is no danger of the wool being deteriorated thereby, as some have pretended.

It is beyond contradiction, that the fineness of the wool in sheep, is principally derived from the nature of the race : that a coarse woolled species of sheep remains coarse and straight haired, though eating exactly the same food as another fine woolled species, which on the contrary produces a fine and thick woolled offspring ; that in the same countries, both colder and warmer, there are found both coarse and fine woolled sheep, without any particular change in the breed, if they do not happen to couple together. It must not, however, be denied, that a better and more suitable food improves the size of the sheep, their health and fatness, all of which may, in the long run, have an influence on the softness and the quantity of the wool. In the same manner experience proves, that a moderately warm climate is the most proper for sheep. In China, and the neighbouring hot countries of India, sheep are only used for food, and they are there
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only provided with very thin hair. Browne informs us, that European sheep, in the hot climate of Jamaica, had their tufty wool metamorphosed in the course of one or two years, into nearly goats' hair. On the contrary, the long legged sheep in the coldest climates, are covered with a rough and straight wool, under which there is found another fur, with a softer and more tufty wool, but under the belly, and on the inside of the thighs, they are mostly bare. That in the mean time, such sheep thrive better with severe cold, than others under the tropics, is proved by the instance of that country, so strongly discountenanced by nature, Iceland, which first began to be inhabited about nine centuries ago by fugitives, who sought there a sanctuary from the then tyrants of the North. That land is not now without numerous flocks of sheep, so that a single countryman is said to have from 500 to 1000 head, and the poorest at least sixty. They are also very easily maintained, as the sheep themselves for the most part seek for their own food, on the ground covered with snow; and those which live on the mountains, are said to be the fattest. These sheep are said to resemble much our Gothland breed; they have short tails, and the rams many horns. The sheep on Gothland, and the neighbouring islands, also go out the whole winter, and are noted for their incomparable fatness. This breed of sheep is also in proportion the most
numerous,

numerous, and their wool the best of the pristine Swedish native races, which last named still rather resemble the Gothlandish in shape, except that the ram's horns are very short.

To feed sheep constantly in the house, as the ancient Romans are said to have in part done, with a view to produce more wool on the Tarentine, or what were called the Grecian sheep, seems almost to be contrary to nature, and is at the same time extremely expensive. Yet the assertion of some, that housing sheep deteriorates the wool, and that their constantly remaining in the open air, and being led from one province to another, is the principal cause of the fineness of the Spanish wool, is best cleared up and refuted by our method of uniformly feeding the sheep in the house from December, to the beginning of May, by which the wool loses nothing of its fineness. The house rams so common with us, which in towns are fed all the year round under cover, neither gain nor lose in fineness of wool, though it may be increased in quantity by a more abundant food. It is true, indeed, that the wool is generally fine, thick, soft, and short-tufty, on the Leoneſe and Caſtilian ſheep, which in autumn are removed to Eſtremadura, in winter to Andaluſia, in ſpring are brought back to New and Old Caſtile, and in ſummer to Leon; and thus the whole year round, wander about in the open air, except the day on which they are to be ſhorn;
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and on the contrary, that the wool is generally coarser and longer, or very like the Barbary wool in Andalusia and Estremadura, where the sheep constantly remain at home. The reason of this difference in the same country is principally to be found in the dissimilarity of the race of sheep; especially as it is demonstrable that not all the wandering sheep in Spain have the finest clothing wool, nor all those that remain at home the long hairy combing wool. It is granted, however, that the removing of the Leoneſe and Caſtilian ſheep to and from the ſouthern and more lowland provinces, where the paſture in winter is good, but in ſummer is burnt up by the ſtrong heat, may contribute a great deal to the thriving of theſe creatures, and alſo to the abundance and ſoftneſs of their wool. At the ſame time the Engliſh and Eiderſtadtish ſheep are not moved, and preſerve their wool in equal goodneſs, there not being the ſame reaſons in Spain, to make a removal neceſſary for them.

By our ſheep being ſheltered in the houſe in winter, all hurtful cold is prevented, as well as in Spain, where there is alſo no want of ſnow and froſt upon the high grounds and mountains. In order to obtain a temperate warmth, double doors are in winter hung upon their houſes, and air holes opened in the walls. In ſpring the ſheep are always more delicate, and ought never to be let out in the morning before the froſt be thawed, and the dew dried up. It is not leſs eſſential that

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they have a roomy and well situated house, since the most healthy sheep, like other living creatures, need a wholesome air, which, at the same time, they corrupt with their own breath. Thirty sheep require a house twenty feet square, and from eight to ten feet high, with a thick wainscoted ceiling. If the number of sheep that are put into the house is greater, six feet square are commonly reckoned for each sheep. It is usual also to separate the rams and the ewes of one and two years old from the older ones; but according to my experience, fresh air and moderate warmth, are of more consequence than separating them according to age and sex.

Some owners of large stocks of sheep, particularly in the kingdom of Gothland, like the ancient Romans, and several sheep owners in those times, do not allow their sheep to couple before the third autumn. They keep them for this reason not only in separate houses, but also in separate inclosed pastures, and towards the end of October, cause them with much order and regular changes, to be covered in each house by rams chosen for that purpose, which are afterwards entirely separated from the sheep. It is perhaps possible, that a larger race may by this means in time be procured; but, besides that this order is very troublesome to the sheep-farmer, I am of opinion that it is contrary to free and simple nature. All animals pine, lose their appetite, if not their health,
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and at the same time couple afterwards with difficulty, if they do not get their desires satisfied in the strongest rut-season; and this must particularly be expected of sheep, which are naturally melancholic. My sheep have, perhaps more than most others, preserved the same fineness, bigness, good plight, and health, have seldom become barren, and never *cast* their young, notwithstanding that they were always allowed to couple whenever nature suggested it, which, however, seldom happened before the end of the second, or even in the course of the third year. And although there was at least one ram for each score of sheep, and consequently several of these creatures used to go together in the same pasture, they never hurt each other, when the sharpest horns were sawed off nearly to the quick; but the weakest always gave way to the strongest, and yet none of them failed in the open field, in getting an opportunity to satisfy their desires. When any old ram began to be too mischievous, he, together with other sheep set aside as being old, sickly, or less woolly, was killed in the autumn. It is highly necessary, that brisk and plump individuals be chosen for breeding rams: they ought to have a uniform white wool, particularly under the belly, on the legs, on the cheeks, and on the forehead. And they ought not to be allowed to be more than six or seven years old. The wool, indeed, keeps its fineness to the latest old age, though it may be-

come somewhat shorter ; but the race degenerates if the rams be too old. In the whole animal kingdom it appears, indeed, that the likeness in the progeny is the nearest to the parent that is the youngest, the strongest, or the most spirited, at the time of copulation ; yet the Messrs. Alströmer, father and son, who have such great merit in furthering the propagation of the fine woolled breed of sheep in this country, have by various experiments, both on sheep of the same race and cross breeds (*partus hybridus*), confirmed the opinion among naturalists, that the likeness is generally derived from the father.

When nature has its free course, the greater part of the lambs are produced in this country within a fortnight before or after Christmas or the new year.* These early lambs are indeed, with us, a little more costly to maintain, than those that are dropped towards the spring ; but they are also much stronger the ensuing autumn, provided the lamb and the dam be well taken care of during the first few weeks, and foddered with good hay, in separate divisions from the rest of the large stock of sheep. I also formerly, with a view to a supposed improvement of the breed, had the tails of the young ewes cut off, according to the Spanish practice ; but a dairy maid, who was offended at this unnatural mutilation, which

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* This is also said to be the usual lambing time in Spain.

in truth also long impedes the poor creature's walking, determined me to give it up: and experience has proved that the ewe does not find herself incommoded by her long tail, when the right rutting time arrives. When the lambs are dropped early, the dams are not so long weakened by it, after they get out into the pastures, and they drive their lambs from them at a more suitable time than we can point out. When the lambs are allowed to follow their dams too, they learn from them both to drink and to browse, which they otherwise cannot be brought to do without difficulty. They who, besides this, milk their sheep, do not long preserve the breed in equal perfection. In Spain itself the shepherds, it is said, do not milk the sheep, but carry goats with them along with the flocks, for the sake of milk.

Salt to be sure, cannot, properly speaking, *generate* fine wool; but in as much as it increases appetite, and promotes warmth during rainy and cold weather, it may contribute to the thriving of the sheep. Different species of worms, but in particular liver worms (*fasciolæ hepaticæ*), and leeches (*hirudines*), dropsy, and the jaundice, are their most common distempers; and they are prevented and cured by means of that most favourite article, salt. In Spain, the wandering fine woolled sheep are said especially to get a great deal of salt when they are driven away from the
winter

winter pastures, but less at the other seasons of the year, unless there happens to be rainy weather. The good effects of salt may also be more quickly promoted by what are called lickings (*Slekor*), which are used in Sweden, consisting of salt, pulverized wormwood, and juniper berries, which are either given so, in a coarse powder, or made with tar into a thick broth, or electuary, which is given to the sheep in a hollow fir trough, which stands in the middle of the sheep house, and over which branches of fir are nailed across, to prevent the sheep from soiling themselves with the broth. Others mix brimstone with this pottage, and make balls of it, which may be particularly suitable for such sheep as are subject to eruptions. Some persons also mix with it, tansey (*tanacetum vulgare*), bay berries, and garlic, as being good for worms, and the dropsy. Among the things, which ought to be considered as both food and physic, hop tendrils and leaves deserve to be named, which the sheep eat after the hops are gathered, with the same eagerness that they do other bitter plants which are so wholesome for them.

The native Swedish sheep, which are either remarkably white, or black, as also the mixtures of the English, German, and Polish sheep, which either yield a straight combing wool, or a wool that has curly locks, are generally shorn twice in the year, without counting the coarsest hairy kind

kind called *Lædja*. They otherwise are apt to cast their wool at the usual shearing season. This sort of wool is the most general in this country, though it is of very unequal goodness. Some persons from an immoderate zeal in favour of the fine tufted Spanish breed, have advised, that the peasantry should use that species, and that universally; but assuredly a long haired combing wool, especially from English and Eiderstadtish cross breeds, which are larger and more woolly, is the best suited, and most indispensable sort, for our Swedish independent peasants, holding of the crown, who possess above two-thirds of the kingdom; as well as for our peasants that hold of subjects, and for our cottagers. Their industrious women employ themselves during the long time that the earth is locked up in this country, with knitting stockings, weaving various woollen, or mixed linen and woollen stuffs, as also in many places home-spun and coarse cloths, both for themselves, and their husbands and children. The Spanish breed, with the finer clothing wool, is more profitable for gentlemen, who in this country for the most part, by means of their dependants, cultivate their own grounds. The Spanish breed is shorn only once a year.* In Spain the sheep are said to be shorn on their return from their

* It surely would be worth while to try clipping the Spanish breed in Sweden twice a year; where they are housed, it could be done without risk,

their winter pastures, at the beginning of May, in the neighbourhood of Segovia, and in the month of June, at Burgos, which is farther north. The greatest number of persons in this country, have also their shearing time a little before midsummer. But as the weather is often still cool with us at that season, it has been found of late years the most advantageous to let that operation be performed in the month of July, after the meadows are mowed. The wool also grows the fastest in our country about midsummer, and it never falls off with me; neither is the heat often oppressive before the commencement of the dog-days.

Before the shearing, the wool with us is almost universally washed upon the sheep. Some persons wash their sheep in the open sea, or in running water, but this is never so clean, as when the sheep are first washed in a large tub, with one part clear lee, two parts luke-warm water; with a small quantity of urine; and then in another tub, with less lee in the water; after which the sheep are washed, laying them always on their back, with their heads up, in a tub with clean water; and lastly, there is poured on the sheep, standing on the ground, a sufficient quantity of water, which is as much as possible squeezed out of the wool. The sheep are afterwards driven into an unpastured adjoining meadow, and remain there (to prevent their soiling themselves in the sheephouse)

sheephouse) a day and night, not only till they be dry, which in good dry weather happens within the third day, but also, if bad weather does not threaten, some days longer; so that the same grease, or *salve* as it is called, may again gather on the wool, which gives it a softer feel, and perhaps adds a little to the weight. Some persons wash their sheep twice, which I also once tried, but the wool became rougher in consequence of it, and in fact of a greyer appearance. The great quantity of grease, which the finest Spanish wool contains at the first washing, mixes with the lee water, and makes it quite soft and soapy; but this grease is wanting in the second washing, so that the water is not in the least softened. If the first washing is well performed, the wool is by that means several per cent. cleaner than the foreign wool that is imported, which has not been washed after the shearing.

Others earnestly dissuade from washing the wool on the sheep, on the supposition that in consequence of their aversion to water, it must do them harm; which bad consequence, however, I for my part have never perceived. Sheep are not indeed used to swim; however I have seen house rams, that had taken an attachment to horses, rush after them across branches of lakes, so that hardly more of the body was visible than the head. In Spain it is said the wool is generally first shorn, and then soaked, stirred, and trampled for two hours in a tub with

warm water. It is afterwards rinsed in running water, and laid wet in a heap, that the water may run off: and at last spread out on a meadow, that it may be well dried before it is packed into sacks. The dirty wool is said to lose by this washing, from 50 to 55 per cent. in weight. Some proprietors of manufactures in Sweden, have adopted the following method of washing: they put the dirty wool into a cauf, with a great number of holes bored through it, which is placed in running water near the projection of a bridge, and fixed to it by means of a hinge at one corner. The chest thus fastened to the bridge can, by means of a crooked stick, be quickly pushed down into the water, in a circular direction, and drawn up again; by which means the water is alternately driven in and out, through the holes: after three days and three nights soaking, performed in this manner, together with repeated rinsings, the wool is said to become perfectly white and clear. If some persons in this country thus wash wool in different ways, there are others again, that do not wash it all, but rather choose to take a lower price for their wool, which, however, must always be washed afterwards at the cloth manufactory. In home-spinning for the use of families, the washed combing wool is reckoned not to spin so well as the unwashed, which still retains its natural grease and clamminess; but the yarn must afterwards be well washed before it will take a die.

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To mix different sorts of sheep for the sake of a breed, is quite common here in Sweden, so that the ancient race of the country, which produced a slight, thin, straight, and short haired wool, is now found among the peasants much mixed, particularly with the German curly species. These sheep are looked upon as more easily maintained, than the fine tufty Spanish breed: but according to what has come to my knowledge, the first mentioned consume as much as the last, and yet these are seen towards the spring going half naked: this, however, may perhaps proceed from the circumstance, that the houses in which sheep are most frequently put are too warm, and that they are for the most part fed with leaves, which dry (or heat) them too much: add to this, that the peasants seldom measure off the winter provision so exactly, that there is not something wanting, towards the spring. That the Spanish wool, at least with me, never falls off, is perhaps, besides a more regular distribution of food, and a moderate warmth in the houses, to be ascribed in part, to the circumstance, that my sheep, which are clipped only once a year, are shorn late, after the cutting of the hay crop. The peasants reckon their sheep much more profitable, for this reason, that they lamb commonly a year earlier, often bring forth twins, and sometimes lamb twice a year, and consequently give more food to the owner; all which, on

the contrary, happens less frequently with the Spanish fine woolled sheep; nor indeed is it wished by those, who are anxious about keeping up the breed. The tanned skins too of Swedish and German sheep mixed, are affirmed to be stronger than those of the Spanish; but on the other hand, the skins of these last, with their thick tufty wool, have a great preference when they are prepared for furs and rough skins.

I doubt whether mixing European and Barbary sheep together, with a view, according to the idea of some, to procure a finer wool, would be advantageous. At least four large Algerine sheep, which I got some years ago as a present, as being an uncommon race, had a long and rather coarse combing wool, so that I thought it best to part with them. They had brown calf-like heads, with long ears, and that species of large broad tails which among the Jews made the fat of the offering, and which in Arabia and Egypt are said to weigh 20 lbs. and to require a small wheel-carriage to carry them. The oldest and finest Spanish race was very probably Syrian, which breed of sheep, both in former times and now, are known to be fine woolled; but if it is true, according to the assertion of others, that all Spanish sheep originate from Africa, it is at the same time likely, that they have been in part altered for the better under the climate of Spain, which has been further tempered by their yearly removal

val to a mountainous province, and, to one six or seven degrees more northerly, during the greatest heat of the summer. Those extensive navigators the Phœnicians; who had already established themselves in Cadiz above 1000 years before the birth of Christ, and who were afterwards strengthened by their descendants the Carthaginians, in New Carthage (Carthagera) and the adjacent places, probably laid the foundation for the Spanish race of sheep, with perhaps more than one breed; especially, as articles of trade and commerce were the chief object of all their usurpations. Strabo, who lived at the beginning of the first century, celebrates the goodness of the Spanish wool and cloth, with which a traffic was already carried on, at that time; although this author, who was himself a native of Amasia, extols most the black breed of sheep, which were in his own neighbourhood, in the environs of Laodicea in Phrygia. The great naturalist Pliny, who composed his history of the world towards the end of the first century, informs us that the Spanish sheep were at that time generally black; but in point of fineness, he assigns the first place to the Apulian sheep near Tarentum, as do also Varro, Columella, and Martial; which two last, being themselves born in Spain, must have been the best acquainted with the existing sheep of that country.

If an estate is not situated so near a large town, that milk can be disposed of there, or that hay
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may be fold, and at the same time dung be purchased at a small expence, it is certainly impossible to make more profit of hay than by maintaining sheep, which in so great a measure both feed and clothe us. All other cattle which are maintained, beyond the most indispensable necessity, bring with them oftener loss than gain. The sheep, which in comparison with other animals, are bred up with so little difficulty, give us annually at least three marks of wool, if the race is Spanish and well kept; and besides this, a lamb, with a fleece of lamb wool, of one mark; all which put together, superabundantly compensates for its food. Such an early dropped lamb is by autumn nearly full grown, and will bring, when of a choice Spanish breed, at least two rix dollars, in specie. A year-old breeding ram of that kind is fold for three or four rix dollars, and one in its third year, for five or six rix dollars, in specie; which rams sometimes give the owner a much heavier produce of wool than the ewes. The wethers also pay for their food, by six or seven marks of yearly wool, and at the same time provide the family with a constant stock of favoury meat; for good veal often fails, and mutton has the additional good property, that it becomes more favoury with increasing age. A friend of mine at Strømsholm,* who was furnished with my breed of sheep, which he has fed perfectly

* The king's equerry, M. De Reuterstam.

perfectly well, has had from one ram thirteen marks of unwashed wool. The wool, which he washed with great attention and rinsed from all dirt after it was shorn, was sold last year at 42 skillings, 8 r.; and it is believed that this year a full rix dollar may reasonably be asked for each mark. Wool may be transported from the most distant places with small expence. Neither is it the least advantage of sheep, that, when there is a prospect of a scarce hay year, their number may be diminished, and be easily restored to the full complement in two or three years; which certainly cannot take place with the slow-growing horned cattle. When there is proper pasture ground, and even where there is a sufficient provision of leaves, it must always be looked upon as an ill arranged establishment, if on a farm which produces ten good loads of hay, counting about thirty stone for each barrel's sowing,* there is not one-fifth part set aside for the sheep, and still more, all that exceeds that proportion. A pasture, which gives to a very few horses and horned cattle a scanty food, is yet sufficient, in great drought and the latest autumn, to maintain a pretty numerous flock of sheep.

People have been inclined for some years past to suppose that the Angora goats, from which the camels' hair, as it is called, is got, would not be

* A Swedish barrel is not much different from a Scottish boll—wheat measure.

be less advantageous for our cultivators, than the better breeds of sheep. The patriotic Sir Jonas Alströmer was the first who, in the year 1742, imported from Natolia, an Angora buck and a she-goat; the latter, however, died soon after her arrival. But the descendants of the buck with Swedish she-goats, are said, in the second and third generation, perfectly to resemble the Angora sire of that race. A Swede has also been sent out to acquire knowledge with regard to the management of this creature, and the spinning of the camel's-hair yarn. These goats are not so expensive to feed as sheep, but their annual fleeces are also much smaller; they are however more delicate, and somewhat more dainty than our Swedish goats, though at the same time they feed on trees of the needly species, and particularly the fresh shoots of the juniper. To keep their shining hair clean, there is a table placed in their house, on which the goats jump to amuse themselves. Besides the vicinity of Alsingfos, and some other spots in the neighbourhood of Stockholm, it is known that these Angora goats will thrive in the cold Dalecarlia, and in Finland, and also, that of their hair cloths have been wove, which do not yield in point of lustre to the noted *camelot de Bruxelles*. I, as well as several other householders, am provided with breeds mixed of Angora and Swedish goats, which have hair twice as long and smooth, as the common

mon natives of the country. The hair of the bucks in particular is very bright and long; but for my part I have not as yet sold any of it, but have merely had very good carpets made of it for my own use. Though thirty goats, which are generally maintained at my farm during the winter, were short haired, and in general party-coloured, and had horns, yet the whole breed has in the space of eight years become white, long haired, and for the greatest part without horns, like the breed-buck I got, which was of a mixed Angora race. These get the same fodder as common goats, and are consequently the most easily maintained, of all domestic animals of the horned species. At a future time it will be more narrowly inquired into, how far the genuine Angora goats can in our climate preserve all the lustre, fineness, and softness of hair, which they have in their native country, where, according to accounts, even sheep's wool has a resemblance of silk, more than of real wool.

(PORTUGAL.)

Answers to Queries from the President of the Board of Agriculture, respecting the Sheep of Portugal.

QUERY 1. *Are the sheep originally of the country, or of foreign extraction? are they wild, or perfectly domestic? are they hardy or delicate?*

Answer. They are of the original breed of the country; domesticated; naturally rather delicate.

Q. 2. *In what particular do they differ from other kinds?*

Ans. The genuine breed are small in size, and have very fine wool.

Q. 3. *What is the weight of a sheep when cut up?*

Ans. When in the best order, it may weigh from thirty-four to thirty-five pounds.

Q. 4. *Is the mutton remarkable for delicacy of flavour?*

Ans. If fat, and in good order, it is very delicate and high flavoured.

Q. 5. *What is the weight and common price of a fleece of wool?*

Ans.

Ans. Each fleece weighs about 12 lbs.; if it is well washed and cleaned, it is worth £2. 14s. per *arroba*, or 25 lbs.; but as it comes off the sheep, without being picked or washed, it is sold for £1. 7s. per *arroba*.

Q. 6. What is the quality, length, and colour of the wool? and for what manufacture is it most proper?

Ans. It is short, white, and curls naturally. It is fit for fine woollen cloths, hats, stockings, &c.

Q. 7. At what age does the breed arrive at its greatest perfection? and what quantity of suet does it yield?

Ans. It begins to breed at two years, and at four it is at its greatest perfection; the suet weighs about 6 lbs.

Q. 8. How many lambs have they at a time? and at what season do they year?

Ans. In general only one; it however sometimes happens, though seldom, that they year two at a time: they regularly year in November, and some of the lambs are yeanned with a little, and others without any wool.

Q. 9. How should they be treated, and what is their best food?

Ans. In moderate weather they should graze; but in cold, damp, foggy weather it would be proper to house them in separate pens; then they should live upon hay, straw, and barley, and once a week there should be a little salt mixed with their food.

Q. 10. What disorders are they subject to? and what are the best preventatives and method of cure for them?

Ans. Their most common complaint is bloody urine, for which there never has yet been found any cure. There is another disorder to which they are subject in this country (Portugal); the symptoms are a tumefaction all over their body, attended with great difficulty in respiration: this complaint is soon removed by bleeding in the ears. The itch is likewise a common disorder amongst them, which, however, is soon cured by washing the part affected frequently with a decoction of fresh broom, gunpowder dissolved in strong vinegar, or a strong decoction of tobacco leaves.

Q. 11. Has there been found any method to increase the quantity and length of the wool, or to improve its quality?

Ans. None, but that of adding salt to the food of the sheep, which makes the wool finer.

Q. 12. How often are the sheep shorn in the year? and is there any difference either with regard to weight or quality between the summer and winter fleece?

Ans. They are only shorn once a year, which in this country is always in the month of June.

In this country the rams run with the ewes from the 1st to the 15th of August, after which
time

time they are separated, with a view that they may all yearn about the same time; by which means you will discover the two month's lambs from those that were yearned at the full time; the former should never be reared.

(AMERICA.)

(AMERICA.)

*Answers to Queries respecting Sheep in America,
chiefly confined to those of Pennsylvania.
By a respectable Farmer near Philadelphia.
Transmitted to the President of the Board of
Agriculture by General Washington.*

QUERY I. *Is the breed, so far as it can be ascertained, a native or a foreign species? is it wild, or completely domesticated? is it hardy or delicate?*

Answer. The sheep in America are not natives; there are no wild sheep; they are of course all domesticated. No animal requires more care and attention than this; it is naturally timid and helpless, and seems to have less of the instinct, which in brutes is a substitute for reason, than any other beast. It cannot defend itself against its numerous foes; it is a prey to dogs at home; and if it should stray into the forests, the beasts of prey would soon destroy it. Some are, comparatively with *other sheep*, more hardy, but, compared with other beasts, they are all delicate. The apparent hardiness of some is owing to the little care taken of them, but these are runted and

and small, their fleece bad, wool coarse, and little of it; their teeth soon decay, and they are short lived, though they seem strong enough for a time.

Q. 2. Is it supposed to be pure, or has it been crossed with other breeds? In what respect does it chiefly differ in its shape and appearance from other sheep, whether in regard to height, length, breadth, or otherwise?

Ans. There has been no general care to preserve a purity of breed. Some farmers are attentive for a time, but finally grow negligent. The stock of our sheep is European; the Swedes and Dutch had a few previous to English settlers, but the importations of any consequence were from England. The Germans also brought sheep, and I have known some from Spain; and, I think, a pair of *Persian sheep*; but the great proportion is from the English stock. There are no great varieties, as the breeds have been mixed; but the American sheep resemble most, in shape and figure, those of England. In size they are generally smaller.

Q. 3. What is the average weight of its whole carcass? the weight of its fore and hind quarters? the number of its ribs, &c.?

Ans. The average weight of sheep in Pennsylvania, when fat, does not exceed 48 lbs. nett. I have known the carcass of a sheep to weigh 112 lbs. and have heard of one, weight 130 lbs. The weight

weight of the quarters may be judged of from that of the whole. It lays the fat most on the hind quarters, which are therefore the heaviest. The number of ribs is generally twelve on a side; some have twelve and a false one.

What is called the common run of good sheep, in the Philadelphia market, weigh 60 lbs.; but 80 lbs. the carcass is not uncommon. The price of mutton, the year through in that market, is about $4\frac{1}{2}d.$ currency; and the price of sheep in flocks, when poor, is about 7s. 6d. a piece, or 4s. 6d. sterling.

Q. 4. *What is the nature and quality of the mutton?*

Ans. The mutton of this country differs as it does in others; that fed on short bites, and hilly lands, is the best; the smaller sized, if well fatted, is also the sweetest and best flavoured. It is generally accounted better than the *large* English or German mutton; but the small mutton of Wales and other hilly countries is as good, but I think not superior to ours, in the same kind of country. Our best flavoured mutton is not common in the market of the capital; the largest and fattest is to be found there, but the choicest and finest meat is only to be had at a distance, in the neighbourhood of hilly, or relatively barren, countries.

Q. 5. *What is the average weight and value of its fleece?*

Ans.

Ans. The heaviest fleece I ever knew weighed 13 lbs. nett. The price of wool, on an average, is an English shilling per pound. Three pounds to a fleece is an ample average allowance.

Q. 6. What is the nature, length, colour, and price of its wool, and the purposes for which it is best calculated?

Ans. I am not manufacturer enough to answer this question fully. I have seen home-spun cloth of the fabrick of an English superfine. It is said that we have wool as fine as that of England at least; but it rather appears best calculated for the coarser kind of cloths. These are manufactured here to great perfection, and will outlast any imported. The colour of our wool is generally white, but it sometimes gets dusky from a mixture of the black and white sheep, both of which we have, the white being by far the most common.

Q. 7. At what age does the breed arrive at perfection, and what is the average quantity of its tallow, when fat?

Ans. Few sheep keep their prime longer than seven years; it depends much on their treatment; at this age they generally begin to decline. None will bear to be full fatted and suffered to grow lean, at any age: they always perish with disease, if this happens. The average weight of the tallow is about one-eighth of the carcass, if the sheep is well fatted.

Q. 8. What is, in general, the number of lambs at each birth? at what season of the year do they lamb? and are the lambs well covered with wool when born?

Ans. Three at a birth sometimes happen, two very commonly, frequently but one. No care is taken to prevent the intercourse with the rams at improper periods, and therefore the ewes often lamb in a severe season. The time of yeaning is generally from the middle of February to the end of May; the most are lambed in March and April; some are dropped at Christmas. They are as well covered with wool as is common with lambs of other countries. It is rare for a ewe to lamb twice a year, though I have known it happen.

Q. 9. What is considered to be the best method of managing the breed? to what food are they most accustomed, or seems best to agree with them?

Ans. The answer to the first part of this Query would require a long discussion. We have not been attentive enough to establish solid principles. The Europeans know best how to improve and preserve the breed of this animal, because they have had more experience, and both the flesh and the fleece are in greater demand. It is not the particular race which ought, exclusively, to be attended to, for the same family of animals confined to one another will degenerate. The strain
must

must be crossed, and the points, qualities, size, and figure, be selected from a variety, till the perfect animal is obtained. Some successful attempts have been made on this scale here; but Bakewell in England has indubitably established its practicability and value. Our manufactures are not sufficiently flourishing to create extensive demands for the fleece, and a small addition to our present stock would glut our markets for the flesh. If it were an object, the flesh will bear salting for exportation, but it will be some time before this will be worth attending to. The best method we can now is take, for every farmer to keep a few sheep, not more than a score to a common sized farm. No greater number should be kept together; and these could be attended to without injury to the common affairs of the farm. A prodigious number could be raised in this way, and both the breed, and all other circumstances better managed. Labour is too high, and of course hands too scarce, to afford devoting any to the sole employment of shepherds; nor is the demand great enough to induce making the sheep business a separate branch. Premiums given by government, or from private subscription funds, under the direction of the Agricultural Societies, which are spreading themselves through every part of the United States, would assist in the attainment of what is the most wanted, a perfect breed of domestic animals, horses, cattle, and sheep

2 F 2

included.

included. *Emulation* would be set at work, and the laudable pride of excelling each other, would stimulate intelligent and attentive farmers to this kind of exertion. A breed thus obtained will exceed any importation; the animal will be assimilated to our climate, in which there are some peculiarities not favourable to all imported breeders, or their progeny unmixed.

As to the food, it is of the same nature in most countries. Sheep are close biters and great consumers of pasture; the shorter and drier the herbage in summer the better; in winter they require, in addition to hay, Indian corn, tops and blades, and other dry fodder, some succulent food; but our snows forbid the turnip fodder extensively. I had one winter a great quantity of the root of scarcity, and my sheep were never more thriving. It is the most nourishing and healthy food I ever experienced for this animal, and horned cattle.

Turnips are watery and thin food; but sheep should have these, or carrots. Next to the camel, the sheep will subsist the longest without water; when the snows lie long, I give them the branches of the pine, and it has a surprising effect as a preventive against their disorders. Indian corn is most common for fattening winter sheep; it goes the farthest *ground*, and licked dry, adding a little salt occasionally. Every store sheep should have an ear or two of Indian corn twice a week; this preserves their strength, and prevents shedding the
fleece,

fleece. Sheep should not be kept in close stables, except when the lambs are young, and the weather then cold or wet. Open sheds or hovels, and exposure at their pleasure, are greatly preferable. Cold never injures grown sheep or strong lambs: wet long continued, kills them. A change is necessary, both of pasture and local situation; they never thrive if kept more than five or six years on the same farm; those from hilly countries will fatten fast in low lands; but they must be immediately sold to the butcher.

Sheep will eat noxious herbs and plants, which other beasts avoid. It is true, they can eat, without danger, many things poisonous to horses or cattle; yet they have no sagacity in the selection, but stupidly and indiscriminately devour whatever they meet with in the vegetable creation. They eat the tops of several species of the night-shade without injury; but not being able to distinguish the different kinds, they are killed by some species of this tribe. It is also thus with the laurel and the ivy; they eat these without distinction, though some species of these productions kill them. There is a low plant with a serrated leaf, striped with white, appearing something like the aloe, but very small, which, if eaten, is certain death to them. It is frequent in our woods, and they eat it whenever it falls in their way. Sheep, deer, and goats can feed with safety, on many things fatal to other animals; but both the latter have

have more sagacity in the selection than the former.

Q. 10. *Their diseases and cure?*

Ans. The most common diseases are the *scower* and the *rot*. The running at the nose I take to be a companion or consequence of the rot, which in its first stage, seems to be a species of *catarrh*. Wet weather long protracted, too luxuriant herbage, wet and four pastures, or too much water, will produce the *scower*, which is a forerunner of other diseases. Removal into dry pastures stops it; salt is also a remedy. The putrid air of confined stables or folds, wherein too many are kept together, is one cause of the rot. I do not believe, that when the taint is fixed, the animal is ever perfectly cured. Removal to salt meadows has checked this disorder when in its first stages. Tarring the troughs in which they drink, and stinting the quantity of water, are also beneficial. *Camphor* rubbed on their gums, and given in the form of pills, is an excellent remedy for many disorders in sheep. The free use of pitch-pine buds and branches, is an efficacious preventive and remedy. Sulphur is beneficial in the first stages of the rot. The *scab* is not uncommon; poverty, filth, and too great numbers together, produce it. *Lice* are also the companions of poverty: the radical cure is, to decrease your numbers, and keep no more than can be well fed and attended. In the first instance, separate the infected from the healthy sheep. A decoction of hel-
lebores

lebores or tobacco, and tar ointment, are serviceable in the first attacks of the scab, which, in its commencement, is a cataneous disease. Train or linseed oil poured in a line from the forehead to the tail, along the back, will banish lice in sheep or cattle. There is an infinite variety in the countenances of sheep; examine the largest flocks, and you will not find two faces alike. Some observant farmers can tell every sheep by its face, in their own flock. The changes appearing in the countenance and eyes, indicate disease or recovery; but I know not what are the symptomatic appearances peculiar to each. I have known some persons who either had knowledge of this, or were fortunate in *guessing*.

Q. 11. *The methods, if any, to improve the fleece?*

Ans. I am unacquainted with the methods of improving fleeces. I have heard of some, but they appear to me whimsical. If the fleeces begin to fall off in the spring, owing perhaps to relaxation from too much warmth, or weakness, giving them Indian corn will set the fleece, by strengthening the sheep.

Q. 12. *The clipping of the fleece, and its summer and winter weight and value?*

Ans. The fleeces are clipped but once a year; all our fleeces are taken off in May or June. Sometimes we shear the early lambs in July or the beginning of August; but it is not commonly practiced.



EXTRACTS

FROM

INSTRUCTIONS FOR SHEPHERDS,

AND FOR

OWNERS OF FLOCKS.



BY M. DAUBENTON,

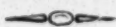
MEMBER OF THE ROYAL ACADEMY OF SCIENCES, OF THE
ROYAL SOCIETY OF PHYSIC, LECTURER AND PROFESSOR
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PETERSBURGH, VERGARA, DIJON AND
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1800.





EXTRACTS, &c.

ON EWES.

QUEST. *What precautions are to be used with regard to the copulating of sheep?*

Ans. A good choice must be made of rams and ewes, for the purpose of meliorating the breed, or to prevent them from degenerating. Particular care must be taken not to admit but such, as are in good health and of a proper age. If you perceive, that any of the ewes refuse the ram, you may give them some handfuls of oats or of hemp-seed, or a mixture made up of an onion or two cloves of garlick, cut into small bits, and mixed with two handfuls of bran and half an ounce of salt. The rams are to be treated in the same manner, when they are not eager enough.

Q. *What care must be taken of the ewes after the copulation?*

Ans. They must be kept from every thing, that might tend to kill the lamb in the mother's belly or to cause abortion. Bad feeding, fatigue, jumpings, compression

compression of the belly, too much heat, or frights may occasion such accidents, which are but too common.

Q. How can the accidents, that cause abortions, be prevented?

Ans. We cannot prevent the frights occasioned by a peal of thunder, or by the appearance of a wolf; but we can hinder the dogs, rams, or other animals from frightening the ewes. They must be well fed, guided gently, and not put in a situation of leaping over ditches, rocks &c, or of pressing too close to each other, or of jostling against gates, walls, stones, or trees.

Q. How long do the ewes carry their young?

Ans. About one hundred and fifty days.

Q. How can one know, that an ewe is near yeanning?

Ans. By the swelling of the natural parts, and of the udder, which becomes full of milk, and by the flowing of the water.

Q. How long does this happen before yeanning?

Ans. Twenty-five days, and sometimes a month or six weeks.

Q. What is to be done, when an ewe is too long a time without being able to yeann?

Ans. You must endeavour to find out, if it be owing to weakness, or on the contrary to an excess of heat and agitation. In the last case it is proper to get it blooded. But if the ewe is weak, you must make her drink two glasses of some tart liquor, such

such as beer, cyder, or perry; and that liquor is to be preferred, which happens to be the cheapest. You may also give her the provender, which has been recommended above for the purpose of exciting heat at the time of copulation. But before these remedies are used, you must be very sure, that the delay in yeaning is owing merely to weakness; for they would be very hurtful, if the ewe, instead of being weak, was too much agitated.

Q. What are the signs, by which one can discover, that an ewe is too warm and too much agitated?

Ans. When her ears are warm, and her pulse quicker than those of the other sheep, when her tongue and lips are parched, and when you perceive a palpitation in her sides, she is too warm &c.

Q. What is to be done, when an ewe is yeaning?

Ans. There is nothing to be done, if the lamb presents itself well and comes out with ease; but if not, it must be helped out by drawing it gently. It is not to be drawn, but when the ewe herself makes some efforts to push it out.

Q. What is to be done, when the lamb presents itself badly?

Ans. You must endeavour to put it in a situation so as to come out.

Q. What ought to be it's situation for the purpose of dropping with ease?

Ans. It ought to present the end of it's nose at the aperture of the matrix, and have it's two fore feet under the nose and a little forward; the two hind legs are turned under it's belly and stretch backwards, according as it comes out of the matrix.

Q. Which are the most usual bad situations, that prevent lambs from coming out?

Ans. 1. The bad situation of the head, when a lamb, instead of presenting the end of its nose, presents some part of the top or sides of the head, while the end of the nose is turned on one side or backwards.

2. The bad situation of the fore legs, when, instead of being stretched forward, so as to have the feet at the aperture of the matrix, they are turned round the neck, or stretched backwards.

3. The bad situation of the umbilical cord, when it passes before one of the legs.

Q. How can a shepherd change these wrong situations?

Ans. When at the aperture of the matrix he feels the head of the lamb instead of the snout, he must endeavour to push back the head and to draw the snout forward. He must oil his fingers for this operation, lest he may injure the ewe or the lamb. If he does not see the fore-feet, he must search for them and endeavour to bring them to the aperture. If the fore-legs are stretched backwards, he must strive to get the head out,

out, and then draw the two fore-legs or at least one of them, to prevent the shoulders from forming two great an obstacle to the coming out of the body. If the fore-legs continued to be stretched backwards, it would be necessary to drag the lamb with such force to get the shoulders out, that there would be danger of killing it. When the shepherd perceives that the umbilical cord passes before one of the legs, he must endeavour to break it without drawing out the placenta or after-birth. The cord breaks of itself, as soon as the lamb is dropped.

Q. What is the placenta?

Ans. The placenta is composed of the membranes, that enveloped the lamb in the mother's belly; they fall some time after the dropping of the lamb. If the placenta does not come out of itself, the shepherd must endeavour to draw it gently; if he dragged it with force, he would run the risque of breaking it, or of tearing the matrix, or of drawing it out along with the placenta. When it is come out, it is put aside from the ewe to prevent her eating it.

Q. What is to be done with an ewe, after she has lambed?

Ans. Some hours after, you must give her some warm water, bran, barley, or oats, and the best nourishment, that can be had in the season. The lamb is to be left with her for some days. While she is suckling, she must be well fed.

Q. What

Q. What is to be done to make an ewe suckle her lamb and take care of it?

Ans. The nipples of her udders are to be pressed, so as to make them give some milk. You must observe, if the ewe licks the lamb for the purpose of drying it: if she does not, scatter a little salt upon the lamb, and then put it near the mother, for the salt will induce her to lick it. If the season is damp and cold, the mother can be assisted as to this operation by rubbing the lamb with some hay or with a cloth. Ewes, that lamb for the first time, are more apt than others to neglect their lambs; to make them more attentive, they are to be separated from the flock, and shut up in some place with their young. If a lamb does not search for the udder of itself, you must bring him near to it and make some milk fall into his mouth. If the mother rejects the lamb and will not let it suck, she is to be held fast, so as that the lamb may get at the udder.

Q. How many lambs does an ewe drop at one time?

Ans. Usually but one, sometimes two, and very seldom three. There are some breeds, that lamb twice a year. It is said, that those of the principalities of Juliers and Cleves lamb twice in the year, and give two or three lambs each time, so that five ewes drop about 25 lambs in one year.

Q. What

Q. What is to be done, if an ewe drops more than one lamb at a time?

Ans. If she is fat, if her udders are large and full, and if the season begins to be favourable for pasture, two lambs may be left with her; but the third one must be removed. You must also remove the second, if she is weak and has but a small quantity of milk, or if the season is bad.

Q. The ewes, that have not milk enough, how can they be brought to have more?

Ans. Give them oats or barley mixed with bran, turnips, carrots, parsnips, boiled peas or beans, cabbage, ivy, &c. and put them on the best pastures. It has been observed, that a change of pasture gives them an appetite and is of great service to them, provided the one, that they are removed to, be not worse than the other.

Q. At what time can they be milked?

Ans. When the lamb cannot suck, the mother is to be milked, and the milk given to the lamb. The ewes can be milked, when the lamb is dead or weaned. Some German shepherds wean the lambs after eight or ten weeks, and then milk the ewes during the whole year. When the lambs are able to feed, some people separate them from the mothers, without weaning them intirely. In the morning, after the mothers have been milked, the lambs are brought to suck whatever milk remains in their udders. Then the lambs are removed for the rest of the day. In the evening

ning they are brought again to suck, after the ewes have been milked. It is said, that this small quantity of milk, together with the pasturage, is sufficient for the nourishment of the lambs. But, if the grass was not nutritive enough, this practice might be very hurtful to them.

Q. What happens to the ewes, that are milked or give suck for too long a time ?

Ans. The flowing of the milk preserves them from several diseases, that might proceed from too great an abundance of humours ; but, when it continues too long, the ewes grow lean and poor, and yield less wool.

Q. Which are the ewes, that can be milked ?

Ans. There is no danger in milking ewes, whose wool is of a bad quality and produces little. But you must not milk such ewes as yield good wool, and particularly those, the breed whereof you intend to improve or to keep up. However, if there were any danger of such diseases, as are produced by abundance of humours, they might be milked once or twice a week. It is thought, that this precaution preserves them from *pulmonias*, from the rot, &c. But this milk must be thrown away as unwholesome.

Q. What is done with sheep's milk ?

Ans. It is made use of just as cow's milk ; it gives less whey ; it is richer and of a more pleasing taste. It contains a greater number of parts fit for making cheese ; and there is very nice
cheese

cheese made of it, particularly at Roquefort in Languedoc.

ON LAMBS.

Q. What is to be done, when a lamb is born?

Ans. You are to inspect the udder of the ewe, and cut off whatever wool there may be upon it, for the purpose of knowing if there be milk enough in it, and of drawing out some of the milk, to see if it be good. Then you must observe, if the mother licks the lamb, and if the lamb sucks her.

Q. How can one know, that the milk is good?

Ans. We may suppose that the milk is good, when the mother is in good health, and when the milk is white and thick enough. But if it be clammy, bluish, yellowish, or thin, it is bad.

Q. What is to be done, if the mother has no milk at all or not enough; if her milk seems to be bad; if she is sick, or if she died in lambing?

Ans. You must get the lamb suckled by another ewe, that has lost her own, or by a she-goat, that has milk.

Q. What is to be done, when an ewe will not suckle a lamb not her own?

Ans. It is said she can be deceived by covering this lamb for a night with the skin of the dead one, if the skin is fresh; for, although it is taken off in the morning, yet she thinks, that she has found her own lamb. But there is a more simple method, which consists in rubbing the dead lamb against the one, that is to be put in its stead.

Q. What is to be done, when we have neither an ewe nor a she-goat to suckle the lamb, that has lost its mother?

Ans. You must give it sheep's, goat's, or cow's milk warm, at first by spoon-fulls, and afterwards by means of a tube, the end of which is covered with a bit of linen, so that the lamb may suck the linen. This tube is to be offered to it as often as it would have sucked its mother. The lamb must be kept in a place somewhat warm, to make up for the heat, which it would have received from the ewe. There are some lambs, which after three days time can do without the tube, and drink out of a vessel. At first they are to get milk four times a day, then three times, and afterwards twice, until they are strong enough to eat grass.

Q. If there was no milk, or if one wished to save it, what could be substituted in its stead?

Ans.

Ans. You might give the lamb warm water mixed with barley-meal. But this is less nourishing than milk.

Q. *What care must be taken, when a lamb drinks through a tube?*

Ans. You must not let it raise its head too high; for in that case it might be suffocated by the milk.

Q. *What is to be done, if a lamb is drooping, weak, or lean?*

Ans. The shepherd must observe whether the mother be in good health; if her milk is good; if the lamb sucks her; or if some other lamb comes to steal the milk. There are some lambs, that suck several ewes one after the other, while the lambs belonging to these ewes are deprived of nourishment. Great care must be taken, that all the lambs, particularly such as are most weak, do suck their mothers, and that they do get good milk and in sufficient quantity. The death of the greatest part of the lambs is owing to hunger, or to their having got bad milk.

Q. *Next to hunger and bad milk, what is most to be apprehended with regard to lambs?*

Ans. The *swallowing of wool*. It often happens that it stops the mouth of their intestines, and prevents the aliments from passing, which causes the death of the lamb. When the ewe's udder is covered with wool, the lamb takes this wool into its mouth, drags it off, and swallows

it. On this account the shepherd ought to inspect the udder and cut off the wool that may be upon it. When the lambs feed at a rack, if a flock of hay falls upon them, it sticks to the wool. The lambs, when they see any hay upon themselves, or upon other lambs or on their mothers, wish to eat it, and at the same time drag off some wool, which they swallow. The racks ought to be very low, so that no hay may fall upon the lambs; and, if the shepherd sees any hay sticking to their wool, or to that of their mothers, he ought to shake it off. We will treat hereafter of the manner of discovering, if the lambs have swallowed wool, and of giving them relief.

Q. What is to be done, when a lamb is stiffened with cold?

Ans. If it has suffered severely from cold, you must wrap it up with warm cloths, put it near a gentle fire, and place it in such a manner, that its head be sheltered by its body. In England they put them in a cock of hay or in an oven heated only with straw; some lambs, that were almost dead of cold, have been recovered in this manner. You will give it also a spoon-full of warm milk, or, if necessary, of beer or wine mixed with water. It is to be fed near the fire for some days, if it is weak, after which it is put along with its mother in a covered and close place, until it recovers.

Q. What

Q. What is to be done with the lambs, that do not fall until about the latter end of April or in May?

Ans. They are not to be kept for the flock, because they are weak and small, but fattened for eating. It is easy to fatten them, because they fall in a season, in which there is grass. These lambs are the first-born of young ewes, or the last of old ones.

Q. How are lambs to be fattened?

Ans. They are kept in the sheep-cote, where they suck their mothers every morning and evening, and during the night. In the day-time, while their mothers are out in the fields, they suck the ewes, that have lost their own lambs. There is new litter made for them once or twice every 24 hours. A piece of chalk is put near them, that they may lick it. This preserves them from a looseness of body, to which they are subject, and which would prevent their growing fat. When the ram-lambs, that are to be fattened, are a fortnight old, they must be castrated. The flesh of the wether-lambs is as good as that of the females. But they do not grow as large as those, that have not been cut. Their flesh however has a better taste.

Q. At what age can the lambs take other sorts of nourishment besides milk?

Ans. Some lambs begin to eat at the rack, and to nibble grass at the age of 18 days. Then
you

you may give them the following articles at the rack :

Oat-meal either alone, or mixed with bran; it is said, that bran would swell their bellies, if it were not mixed with some other sorts of food.

Pease; blue pease are more tender and nourishing than the white and grey. By steeping pease in boiling water, and mixing them with milk they become more tender and pleasing. They may be mixed also with oat or barley-meal; but barley-meal becomes disgusting to the lambs, because it sticks between their teeth.

Oats or barley unground. Lambs prefer oats; and it is in fact the most wholesome sort of food for them, and that, which fattens them soonest.

The finest sort of hay.

Straw, that has been thrashed twice for the purpose of making it more tender.

Dry clover, &c. and above all sainfoin.

The grass and herbs of low meadows, and in general those that are fit for fattening sheep.

Q. At what age are lambs fit to be eaten?

Ans. At three weeks at the soonest, and at farthest at two months.

Q. What precautions are to be used, until the lambs are weaned?

Ans. The lambs, that are shut up in covered places on account of the severity of the weather, must not be kept too warm. They are to get air and go out as often as possible, as this strengthens
ens

ens them. When a lamb is eight days old, it can follow its mother near the fold.

Q. When are lambs to be weaned?

Ans. At the time, in which the mother's milk begins to cease; the lamb is then about two months old. This is about the first of May as to the lambs, that fall in the latter end of February, or in the beginning of March. The lambs, that fall before that time, must be let to suck for more than two months, that they may have good grass, when they are weaned. Some people do not wean the lambs until the shearing time. If a lamb remains constantly with its mother, she weans it herself, when her milk fails or when she begins to rut; for then she drives it away. Sometimes the lambs themselves grow tired of suck, when they have good pastures.

Q. How are lambs weaned?

Ans. They are separated from their mothers, and, if possible, removed to such a distance from them, that they cannot hear their bleating, nor the mothers hear theirs. It is usual to put about forty of these lambs along with an old sheep, that guides them and prevents their going astray. They are left to feed in fields of clover, melilot, ray-grass, &c. There is another method of weaning lambs, without separating them from their mothers. It consists in putting a muzzle on them loose enough to let them feed, but which has at the nose some points or thorns, that prick the udder,

udder, when the lamb means to suck it, in consequence of which the mother rejects the lamb. But they must not be too sharp, for fear of injuring the udder.

Q. Is it proper to cut their tails?

Ans. A great deal of filth sticks to the tails of sheep, particularly when they have the looseness of body. Those, whose tails are cut, are cleaner. Such sheep, as have no tails, seem to have larger rumps than the others.

It is proper to cut off the ends of the tails, where the soil is clammy, to prevent the mud from sticking to them and hardening there, which would injure the lambs legs, or excite them to run on account of those lumps of earth striking against their legs.

Q. How are the tails to be cut?

Ans. This operation is to be performed in mild weather, when the lambs are a month, six weeks, or two months old, or in the autumn after they were dropped. The tail is cut at the joint between two bones, and ashes are put on the wound. Should ashes alone be not sufficient, they are to be mixed with suet.

Q. Is the wool of the tail to be cut off?

Ans. It is proper to cut off the wool of the tail, and even of the buttocks, when it is loaded with filth, that might cause itching or the scab.



Pl. III.

Fig. 1.



Fig. 2.



Fig. 3.



Fig. 4.



Fig. 5.



Fig. 6.



Fig. 7.



H. Broca.

* EXPLANATION OF

P L A T E III.



WE see in this plate, fig. 1, the manner, in which a shepherd holds a sheep between his legs and opens its mouth to examine the eight incisive teeth. They are in the under jaw, and the form of them indicates the four or five first years of the age of sheep.

In the first year the eight incisive teeth, fig. 2, are straight and sharp-pointed.

In the second year, fig. 3, the two middle teeth fall, and are replaced by two new teeth, which are larger than the others.

In the third year, fig. 4. two other sharp teeth, one on each side of the two middle ones, are replaced by two new large teeth.

In the fourth year, fig. 5, there are six large teeth, and there remain but two sharp ones, one at each end of the row.

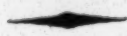
In the fifth year, all the sharp teeth are replaced by eight large ones, fig. 6.

In the sixth year, the grinding teeth begin to wear away.

In the seventh or eighth year, and sometimes sooner, some of the front-teeth fall out or break, as may be seen fig. 7.

* N. B We have numbered the plates as in the original, proposing to translate the whole treatise at a future day.

P L A T E I V.



IN this plate is represented the manner, in which a shepherd ought to inspect the veins of a sheep's eye. He keeps the sheep between his legs; he holds its head fast with both his hands, and raises with his right thumb the upper eye-lid, while with his left thumb he depresses the lower eye-lid, and then he inspects the veins.

If these viens are red, and many of them visible, nearly as we see fig. 2; this shews, that the sheep is in good health, or at least, that it has not the rot, nor any other disease proceeding from weakness.

The tubercle A, and the interior coat of the eye-lids ought to be red as the veins, that appear on the white of the eye.

But, If the tubercle A, fig. 3, and the interior coat of the eye-lids are of a pale red, and if but few of the veins of the white of the eye are visible, and are pale or livid, the sheep is weak, languishing, or threatened with the rot. If the veins cannot be seen at all under any colour, the animal is sick.

Pl. IV.

Fig. 1.



Fig. 3.



Fig. 2.



H. Broca.





Pl. V.

Fig. 1.



Fig. 2



Fig. 3.



Fig. 4.



P L A T E V.

THIS plate represents four lambs in different situations upon the placenta or after-birth, A, A, A, A, fig. 1, 2, 3, and 4, as they present themselves to come out of the matrix or womb.

The lamb, fig. 1, is in a good situation, because the two fore-feet are under the nose and a little farther out than it, and the umbilical cord B, is free.

The lamb, fig. 2, has its two fore-legs badly placed: the left leg B, is turned over the head; it must be brought down under the nose. The right leg C, is stretched backwards; you must endeavour to draw it forward, so that the fore-legs may be in the same situation as those of the lamb, fig. 1.

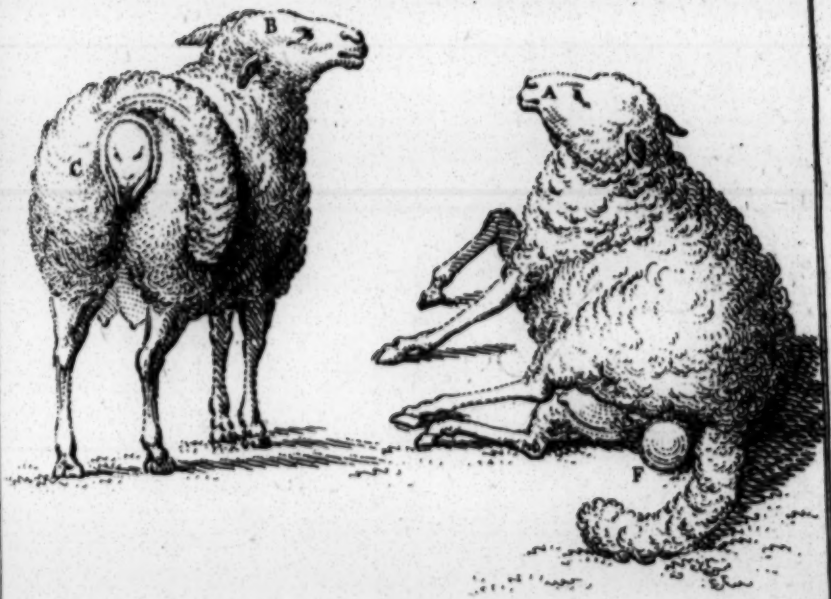
The lamb, fig. 3, presents the top of its head foremost; its nose is turned backwards, and accordingly must be brought forward so as to be in a similar situation with that of fig. 1.

The lamb, fig. 4. has its right fore-leg B, stopped by the umbilical cord C, which goes round it; the cord must be broken, and then the right leg is to be drawn forward and placed near the left one E, that they may be both in the same situation as those of the lamb, fig. 1.

P L A T E VI.

THERE are two ewes A, B, in labour, in an enclosure, formed with hurdles C, and with a wall D, exposed to the south; the rack E, is fastened to the wall. A part of the involucrum of the foetus of the ewe A is already come out of the matrix, and forms a bag F, which is full of liquor.

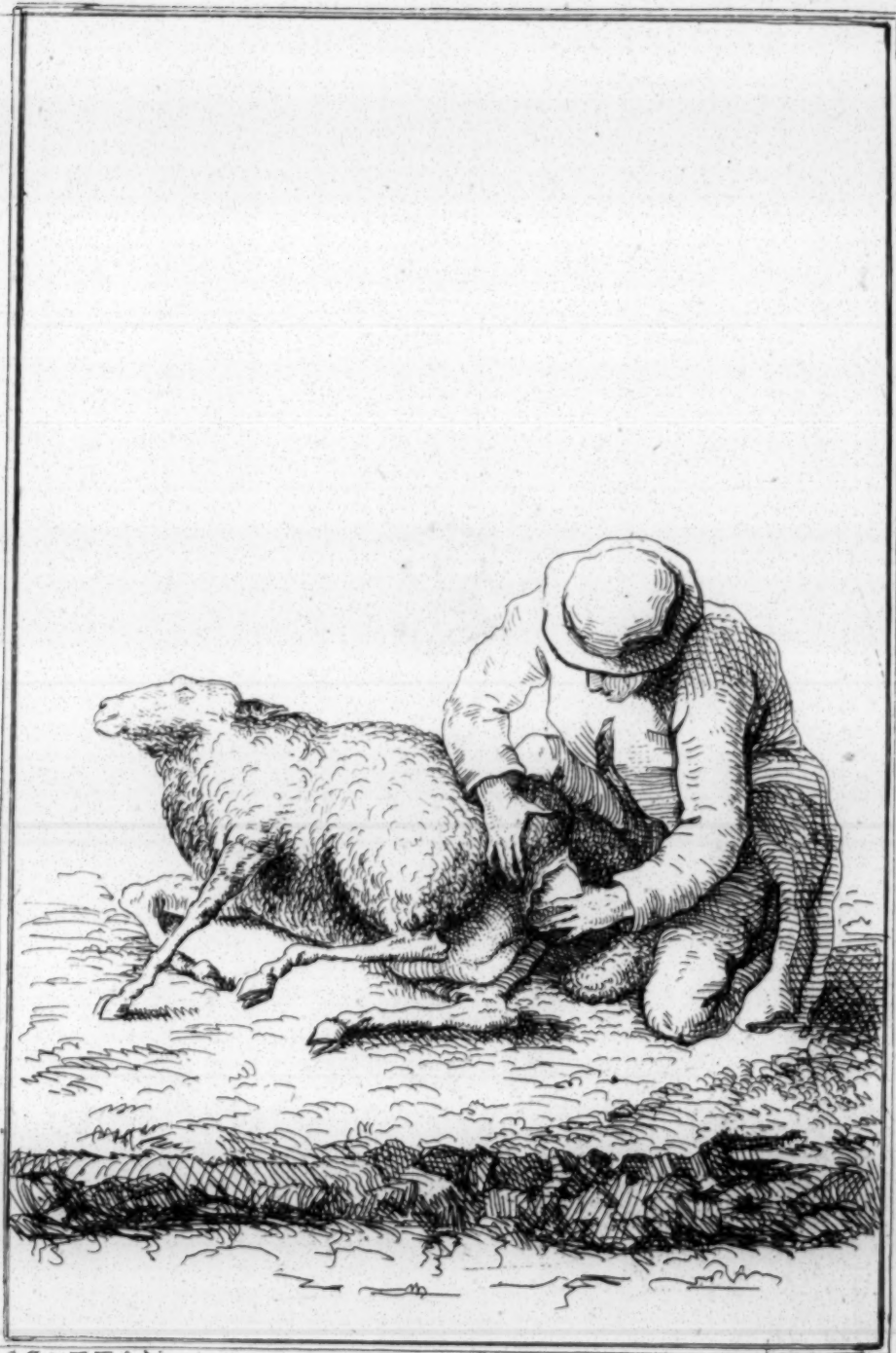
The ewe B, is more advanced in her labour; the involucrum of the foetus are broken, and the head of the lamb C, makes its appearance. The fore-feet are under the nose; in this case the ewe does not want the shepherd's assistance; nor should he even touch her as long as she has strength enough. But if he perceives that she is growing weak, he must treat her in the manner, that has been described above, p. 226.







Pl. VII.



GRATTAN

P L A T E VII.

WE see in this plate a shepherd, assisting an ewe in labour. He draws the head A, and the fore-feet B, of the lamb gently, to bring them out, when the ewe is become too weak. The shepherd ought to dip his fingers in oil, lest he may injure the parts which he touches; he must also avail himself of the exertions, which the ewe makes herself.

But, if the fore-feet do not appear under the lamb's nose, he must not attempt to draw out the head. He must endeavour to pass one or more of his fingers gently between the matrix and the lamb, so as to find out the situation of the feet, and to draw them forward under the head, if the umbilical cord be not in the way.*

* When the ewes seem ready to yean their lambs, great caution should be used by the shepherd. He should not be over forward in giving them assistance, but suffer nature to complete her work. Much damage has arisen from impatience, or hastiness of temper on such occasions. I therefore recommend the waiting with coolness the proper time.

Circumstances sometimes arise, where help may be necessary, but nature will act sufficiently her own part ninety-nine times in the hundred.—(*Experienced Farmer.* 1798)

As

As the fifth, sixth, and seventh Plate will illustrate the directions to assist Cows in difficult births, we have added an Extract from DOWNING'S Disorders incident to horned Cattle—printed in London in 1797.

DIRECTIONS FOR EXTRACTING CALVES.

To extract a calf when it presents itself in any improper position or unnatural way of lying in the cow, and in such postures that it cannot be extracted by the force of men and horses, without present death to either the cow, the calf, or both, until it is moved and replaced, so as to rectify the head and legs, placing them in such an extractionable position or proper form, as hereafter described.

When the efforts of nature are not too much exhausted or weakened, by rendering the necessary assistance in a suitable manner; the extraction in most difficult cases will be easily completed, and the calf brought from the cow, without any injury either to the one or the other. Unless proper and timely relief be given, the cow or the calf is sure to be destroyed, to the utter loss of the owner, as I am confident great numbers of
both

both have been lost in a moment, by people making an attempt to extract a calf, when it has been coming in a wrong position; no one ought to go about the operation who is unskilled in the business, as too many within my observation have fatally done.—I will therefore endeavour to lay down instructions every way sufficient and as plain as possible, which, if properly attended to, will be highly useful to individuals, and beneficial to mankind in general.

A NATURAL POSITION,

Is when the calf lies in the calf bed or bag.

A natural form is when the calf presents itself with its fore-feet and head foremost, with its back upwards, or in the same direction as the cow's back, and the nose lying between the fore-feet.

OBSERVATIONS.

They who attempt the operation, must proceed with great care, when they undertake to examine or search the cow, by using the gentlest means possible, taking a proper opportunity to do it, while the pains or throes of the cow cease.

This is to be done after the bladder of water has been seen, with other evacuations, that always make an appearance some time previous to the calf coming.

Then

Then should the cow remain very restless, with strong pains or throes upon her, for ten or a dozen quick and violent motions, and no part of the calf to be seen, a thorough search must be made to find how the calf lies, in the following manner.

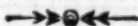
First, supple the hand and arm well with warm water, then anoint them with fresh hog's lard, and introduce the hand gently up the cow's shape, and carefully search round about the calf as far as the arm will admit of, so as to be perfectly satisfied of the exact posture the calf may lie, or be forced into, contrary to a natural situation, position, or form, which I have before described—See *natural position*.—Much danger attending all unnatural extractions, I will therefore endeavour to lay down such methods as will prevent violent means being used, and substitute proper and gentle treatment, with different experiments to be practised in order to effect a safe and speedy extraction, in nearly all the improper postures of a calf lying, as many will be found on examination in several of the unnatural positions here-after described.—Due consideration must be taken, first to move and replace the calf, and put it into a position favorable for extraction.

This may at all times be done best, when the cow is standing upon her legs, and the operator must be sure to get a right knowledge in what manner the calf lies, and adjust the head and legs

legs before any further attempt is made to extract or draw the calf.



UNNATURAL POSITION, OR THE CALF COMING
THE REVERSE WAY, I.



Suppose a calf presents its tail where its head and fore-feet ought to be, when it comes in a natural way, with its hind legs quite under its belly, do not make the least attempt to turn it; push or press the flat part of the hand to the haunches or hips of the calf, until it be removed back far enough to come at the hocks of its legs; when the calf is removed sufficiently back that the hand may raise up one of the hind feet at a time, by taking hold of the inside of the calf's leg at the hock, and pull at it there, the joint will bend so as the clees or horny part of the foot can be inclosed in the hand; this will prevent the foot from doing any injury to the uterus or the calf-bag; such as tearing it or bruising that, or any other part, in the cow.

The foot, that is so inclosed in the hand, is to be brought gently to the entrance of the cow's shape, and if a cord be fixed to, it will be better.

Then the person should proceed with the other foot, and get it up into the same direction, and by the very same method the first was got up, or placed ready for extraction, when both the feet are brought together at the entrance of the shape in a regular situation, there is nothing wanting in this case, but pulling quite steadily at the legs of the calf, to give nature the necessary assistance, observing to do it at the time, the cow has her pains or throes upon her.

CAUTION.

It will sometimes happen, while the operator is adjusting the calf's legs, &c. and placing them for extraction, the navel string of the calf may break, and from that a large quantity of blood will flow rapidly upon the person; this should not be much regarded, as the redundancy will soon stop: this flooding is general with all cows at the time of calving.

The more expeditiously the calf is extracted, when it comes the backward way, the greater probability there is of saving its life: there is some danger of suffocation, when the calf is obliged to be brought from the cow in that way, although

although it is quite as easy for the cow, as any natural position.

UNNATURAL POSITION, 2.

Is when a calf prevents its two fore-feet, and the head does not appear with the feet and legs. In this case a long arm is very useful—supple the hand, &c. as before directed, examine gently where the head is, and it will be found mostly doubled back over the hips of the calf, or perhaps it may lie against the ribs of it on the one side or the other; the situation of the head will be at one time nearer, and another farther off, just as nature has placed it by the cow's motions.

When the calf's nose lies over its rump, much difficulty will arise in bringing the head into its proper place, which is between the fore-legs, that being a position suitable for extraction.

When the nose is not to be come at, the fingers must be got into the calf's mouth and take hold of the jaw bone, and return the head by that means. My method at all times in this case is to keep the arm in the cow to the full extent of it, when the head is so far back, until the pains or throes of the cow will enable me to fix the fingers in the nose or against the jaw of the calf: nature will greatly assist in forcing the calf nearer

in this operation, if the person will keep his arm in the cow, until the head can be completely adjusted. After that is done, the calf may be easily extracted, by pulling at the head and legs, duly waiting for the time, when the pains or throes are on the cow.

POSITION, 3.

Is when the calf presents itself side ways or nearly belly upwards, and the head turned back over the one shoulder or the other with the legs appearing.—Gently remove the calf back with the hand, until you can bring the head forward with the legs into a suitable form fit for extraction, then proceed in the usual way as before mentioned to bring it from the cow.

POSITION, 4.

In this posture the Calf will be dead nine times out of ten, presenting its fore-feet and the head quite under its brisket and belly.—Push the calf back until the hand can be introduced to the nose.

There is a considerable deal of strength and activity required from the exertions of the hand
in

in this operation, to do it well; it chiefly depending on that to bring the head into its proper place, which is to be brought into the same direction as the feet, and placed with them at the entrance of the cow's shape ready for extraction.

When the head is so rectified with the legs, the extraction will be done in the usual way, giving a little assistance at the head and legs, at a time when nature requires it.

It is in vain to attempt to bring the calf from the cow, by pulling at the feet in this case, unless the head be first rightly adjusted.

POSITION, 5.

The head will appear alone, or presenting itself and neither hind nor fore-leg with it; or perhaps the head and one fore-leg only.—Push back the calf with the hand against the shoulders or brisket, until room be had to come at the knees of the calf; in this case the feet are generally folded under the calf's belly; the hand must be got gently to the bend of the knee, and you must pull there by degrees, that one of the feet may be got forward, so as the clees or horny part of the foot can be inclosed in the hand, which will prevent injuring the cow in bringing each foot to

to the entrance of the cow's shape, and in the necessary direction fit to be extracted from the cow, by giving the efforts of nature the usual assistance as before described.

POSITION, 6.

The head and one leg appearing, or the head without a leg with it: this may happen either way at different times. If the head should have appeared a few hours before the cow is discovered to be calving, as many are in that situation, the calf will be destroyed through the cow remaining in that restless state, frequently lying down and getting up in a hasty manner. This is occasioned by the violent agitation of the cow's throes or motions, whereby the head will be greatly bruised and swelled, so as to make it too large to go back for the purpose of getting up the legs. The head to be skinned and cut off, if it is swelled, so as to prevent extraction.

Take a sharp knife and make a slit from the pole of the head, beginning between the two ears, and bring the knife down to the end of the nose.

In skinning it, force the skin back over the first joint of the neck, and amputate it there. Then
the

the calf will pull back by pushing at the neck or against the brisket, either of which is most convenient to remove sufficiently to get up the feet, by taking hold at the knees of the calf and bringing them to the entrance of the shape, in the same way as the directions are given in the last position, to place the fore-feet proper for extraction.—After that, place or wrap the loose skin, which is left on the neck, carefully over the rough and ragged bony part of the neck, that no injury may be done to the cow, by drawing the calf; some part of the loose skin must be pulled at, all the time another person is assisting at the legs, as the stump end of the neck where the head is taken from does not fix itself against the haunch bone of the cow, which will entirely stop the extracting the calf, and it must be put back again to release it.

POSITION, 7.

A calf may be found on its back, with its fore and hind legs folded nearly together over its belly, and close up to the cow's back, with the head appearing, or perhaps the head will be doubled back even with the ribs, on the one side or the other of the calf; or it may possibly happen in such a position, that one of the hind legs may get to the
entrance

entrance of the shape; that must be put back, and the fore-legs and head brought forward; always be sure to secure the clees of the calf safe in your hand, which will at all times prevent doing any injury to the uterus or calf bag, whenever it is necessary to put the feet back, or bring them forward to the cow's shape.

It is to be understood the calf cannot be extracted with one hind-leg and one fore-leg coming together: very little judgment is wanted to make that discovery, there being such a difference between the hocks and knees of the calf, as will be easily found out by the person that searches the cow.

All instrumental methods of extraction I wish to avoid as much as possible.

Many people use a hook to return the head of the calf, when lying in the situation I have described in the second position. This hook should be made of tough Iron, about four inches long, leaving a crooked point at the one end, and a loop or hole at the other, for the purpose of fixing a cord to it. The hook is to be conveyed to the head of the calf, and the point placed either in the sockets of the calf's eyes, cavity of the ears, or in the mouth, which ever the operator finds most convenient to retain fast hold by: the head will replace by pulling at the cord, and by that means many return the head by this method placed in a position proper for extraction.

I would not recommend this method to be put in practice, but as little as ever the operator can help.

My

My common practice is to keep the arm in the cow as before mentioned—See *the second position*,—until I can get hold of the calf's nose or jaw, which I have there directed to be done.—Great danger attends using the hook, should it be moved out of the place it is fixed, as the cow's motions may get it out of its proper place, let whatever care will be taken, and the cow may receive such injury, as will ruin and destroy her, should it catch and tear the uterus or calf-bag, or inwardly bruise any other part of the passage. It is impossible at all times to rely upon its keeping safe where it is intended to remain, while the head be returned into a right direction.

If the calf be dropfical, it will be known from the largeness thereof: and when the extraction cannot be made in the usual way, from the calf containing a large quantity of water, a knife should be cautiously used as follows, by piercing it into the entrail part of the belly of the calf: this will let out the water, when a dropfical calf comes the backward way; it will be safely and easily done, as the abdomen or lower part of the belly will be readily come at by guiding the knife up between the calf's hind legs.

A description of several other positions might be added, but these being the most common within my practice, I trust that great utility may be gained from these plain instructions, by every one that wishes to be informed how to perform such operations.

PLATE VIII.



IN this plate we see how the four legs of a ram-lamb ought to be tied together, fig. 1, to prepare it for castration.

The shepherd, fig. 2, holds the lamb A on his knees, while the young shepherd, fig. 3, keeps its legs with one hand, and places the other hand upon its belly to prevent it from stirring. Then the shepherd, fig. 2, makes two incisions A, B, fig. 4, in the places where he feels the testicles, and draws them out together with the strings that follow them.

In fig. 5, are represented the two incisions A, B, and the string C, together with the testicle D, which are come out of the incision A. The strings must not be torn but cut at the place C. *

In fig. 6, we see the string with its involucrum, and in fig. 7, the same string without the involucrum A, that contained the tube B, and the vessels C. It is at the place B, C, that the string is to be cut, to prevent the animal from generating.

* Some English shepherds bite them off.









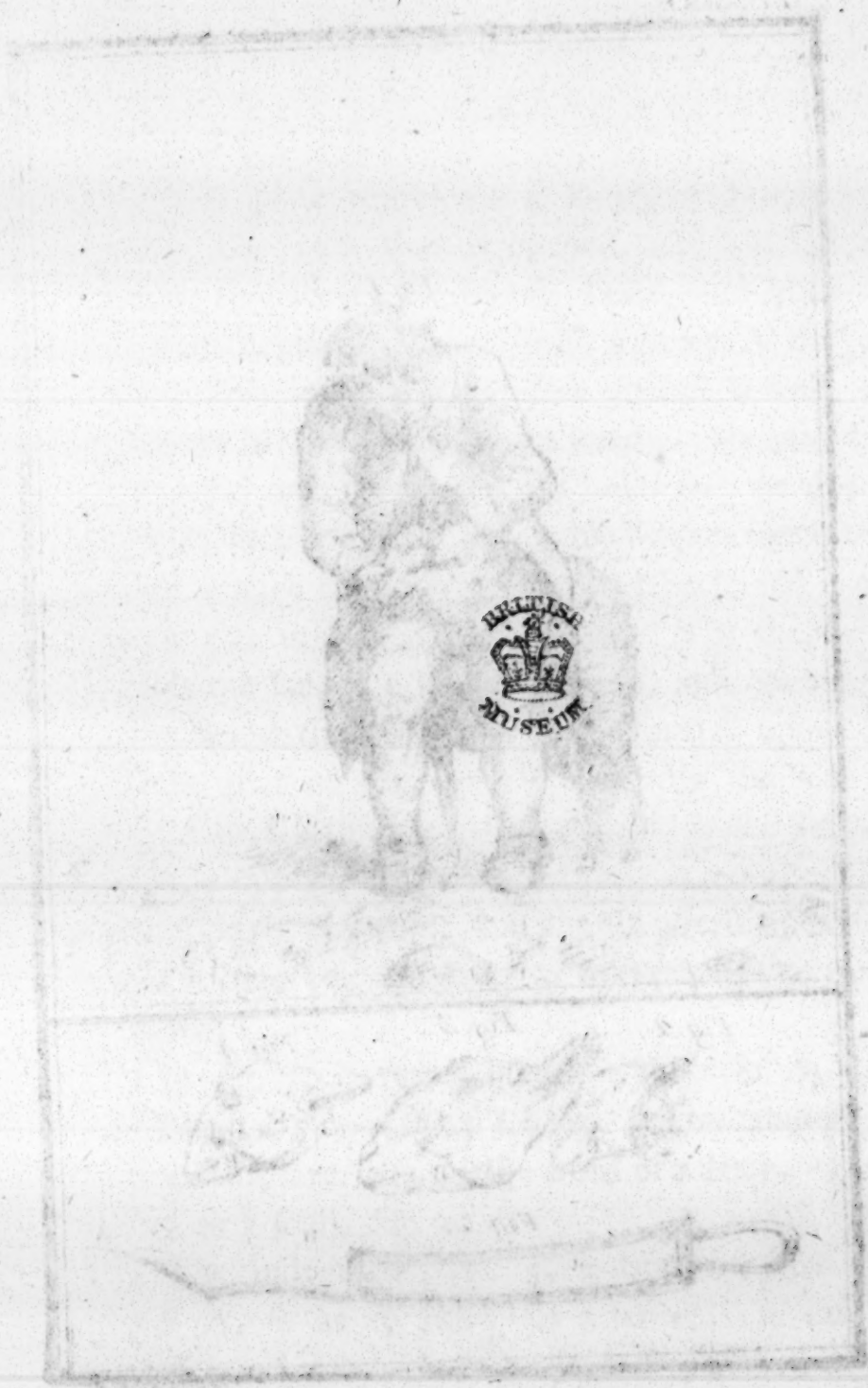
PLATE IX.

THERE is represented in this plate a shepherd A, fig. 1, who holds a knife B, in his hand, and is beginning to castrate an ewe-lamb C. This lamb is stretched on its right side, near the end of a table D E, so that its head F, is hanging over. Another shepherd G, is placed near the head F, of the lamb, and with his right hand holds fast the two fore-legs, and the right hind-leg H. A third shepherd I, keeps fast with both his hands the left leg K, and stretches it backwards. The shepherd A, raises the skin of the left side with the thumb and first finger of his left hand, and forms a fold L, at an equal distance from the highest part of the hip-bone and from the navel M. The shepherd G, lengthens the fold L, as far as the place N. The shepherd A, cuts this fold with the knife B, and makes an incision, which ought to be an inch and a half long.

In fig. 2, is seen the same lamb with the incision A, which is placed at an equal distance from the upper part B of the hip-bone and from the navel C, and in the same line.

In

In fig. 3, we see the hand A, of a shepherd, who puts his finger into the incision B, to search for the *ovarium*. When he finds it, he draws it out gently, together with the parts, which it is annexed to; he cuts off the ovarium, and replaces the other parts in the lamb's belly. Lastly he stitches the place, where the incision was made.



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Fig. 1.



Fig. 2.



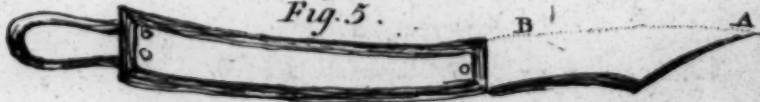
Fig. 3.



Fig. 4.



Fig. 5.



MARRAUD

PLATE XXI.

THIS plate represents a shepherd bleeding a sheep, the vein that is opened, and the instrument, that serves for lancet, knife, and grater.

The shepherd, fig. 1, holds a sheep A B, between his legs with its back against a wall, to prevent it from going backwards. He puts his left hand under its head, and holds fast the under jaw in such a manner, that his fingers touch the right branch of the jaw in its back part, and compress the vein that passes there. The shepherd holds the lancet in his right hand, and opens the vein below the tubercle, that is formed upon the lower part of the sheep's cheek by the root of the fourth grinding tooth, which is the largest of the upper teeth. This tubercle indicates the situation of the vein, and the shepherd can even feel it before he opens it, as it swells by the compression.

In fig. 3, is represented the tubercle A, and the vein B, on a sheep's head. The same parts A and B, are seen on the head of a lamb, fig 2, and on a scull, fig. 4.

The instrument, fig. 5, is two-edged at the end A, so as to serve for a lancet. It can be used as a knife with its blade A B. The end C, of the handle is roughed and forms a grater.

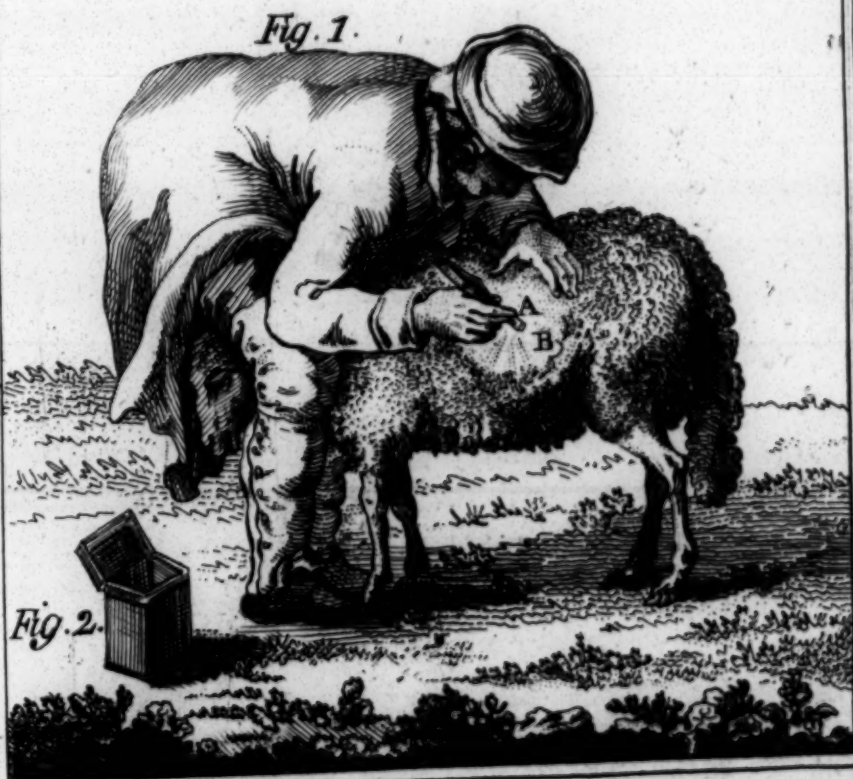
PLATE

PLATE XXII.

IN figure 1, of this plate we see a shepherd scratching a sheep, for the purpose of rubbing it afterwards with the ointment for the scab. At fig. 2, is the box that contains the ointment, and at fig. 3, the scratcher.

The shepherd holds the sheep fast by the neck between his legs, and with both his hands puts the wool aside at the place A, where he sees the signs of the scab, and takes off the scruff with the grater. He then rubs the affected part with the ointment. The suet, that enters in the composition of this ointment, when it is to be used in summer, or the grease, when it is for winter, gives it a consistency, that prevents its flowing off from the scabby parts.

It is only the end of the handle of the instrument, fig. 2, that serves as a grater, as has been said already.





A MEMOIR

ON THE MOST NECESSARY REMEDIES FOR
S H E E P,

Read at a public meeting of the Royal Society of
Physicians on January 27, 1778.

By *Mr. DAUBENTON.*



Sheep bear with all the inclemencies of weather in our climate, except the great heat of the sun; their wool protects them against the most severe cold. I have, for these ten years past, in the northern part of Burgundy, some flocks, which are exposed to the air, day and night, the whole year round; the hard frost of 1768 and 1776, did not injure them in the least, although Reaumer's thermometer was at 14 degrees and a half, and even at 18 degrees below Zéro. The
longest

longest and most heavy rains; the snow that they were covered with, and which they swallowed as the only drink they had; the icicles, that were formed on their wool and stuck to it, did not bring any disease upon them; but the heat of the sun has caused the death of several sheep in the fields, and would have caused that of many more, if they had not been speedily relieved.

The disease, caused by excessive heat, is called by the same name the *heat*. The best fed, the strongest sheep, and those that have most blood, are principally subject to it. The sheep, that are attacked with it, open their mouths to breathe; they foam; blood flows from their noses; they have a rattling in their throats, and a palpitation in their sides. Their eyes grow red: they hang down their heads, stagger, and in a short time drop dead. When they are dead, the eyes, cheeks, neck, and the inside of the mouth and nose are of a mixed red and blackish colour; on opening their bodies one finds the blood-vessels swelled in all the parts, that have been mentioned, and in the head. All these symptoms plainly indicate the necessity of bleeding; and in fact the disease ceases very soon, if they are blooded in time. This remedy is therefore one of the most necessary in hot climates, in temperate climates, such as ours, and even in cold climates, when the sun is very hot in summer.

There

There is another remedy absolutely necessary for sheep in all countries and in all sorts of weather, I mean the remedy for the scab; sheep are more subject to this disease than to any other. Flocks placed upon a soil the most suitable to their species, even to their breed, are not exempt from it; the best attended, the best fed, and the most vigorous sheep may become scabby. When the fat of the grease of the wool grows rank, it affects the skin and gives it a disposition for the scab. If this disease be not checked on its first appearance, it spoils the wool and makes it fall. If nothing be opposed to the progress of it, it causes ulcers in the flesh, rots the bones, and destroys the animal. A remedy for so common and dangerous a disease is even more necessary than bleeding, because sheep are oftener subject to the scab, than to the *beat*. The observations, that I have made on these two remedies, will be the subject of this Memoir.

THE HEAT.

Sheep are blooded in different parts of the body, in the forehead; above and below the eyes; in the ears; in the jugular vein; in the fore-legs; in the tail; in the feet, &c.

Before we examine these different modes of bleeding, it is proper to make some reflections upon the manner of treating the diseases of sheep. It ought

to be proportioned to the strength of the animal, and to the knowledge, that shepherds are susceptible of with regard to medicine and surgery.

A sheep, that is attacked with a lingering disorder, is of little value, and no remedies, but such as are very cheap, should be applied to it. In accidental diseases, which can be cured speedily, the sheep loses nothing of its value, if the remedy be an easy one, and if it does not spoil the wool.

It is therefore necessary that the sheep should be bled speedily, and that the vein, which is to be opened, be large enough to give a sufficient quantity of blood, and in a part of the body, where there is no wool.

I believe, that in most diseases of sheep it is not requisite to choose that part of the body, in which bleeding might seem most favourable. The most skilful physicians do not agree as to the various effects of bleeding from the different parts of the human body; how then could shepherds act, considering the scanty information they could acquire upon a subject, which is not understood as to the brute creation? It is therefore better not to trouble them with a praxis, in which they would commit gross mistakes, and which seems to be useless for sheep in the most ordinary cases.

But, when a disease attacks several flocks, extends from one district to another, and spreads into several provinces, it then becomes an object of the greatest importance and consideration. In these

these unhappy cases all the resources of the medical art must be made use of, and among others that of different bleedings. The most able physicians ought to inquire into the causes and remedies of a disease, that threatens the destruction of these most useful animals.

It is with this view, that the Royal Society of Physicians has established a permanent correspondence with the shepherds for the purpose of instructing them. In pressing cases, some members of the society will go themselves to direct the shepherds as to the method of treating the flocks. My observations upon the bleeding of sheep do not extend to rare and complicated circumstances. I am of opinion, that in ordinary cases, it is sufficient for a shepherd to know how to draw blood in a part of the sheep's body, which is favourable at the same time, as to the largeness of the vein, the facility of the operation, and the preservation of the wool. According to these requisites, I shall now examine the various bleedings, that are used in different parts of sheep's bodies.

The veins of the forehead are small, and accordingly afford but a very small quantity of blood ; they cannot be felt with the finger.

Blood cannot be drawn above or below the eye, or between the two eyes, except from that part of the angular vein, which extends from the hollow between the eye-brows to the upper part of the cheek. Therefore, although these three bleedings are known by three different denomina-

tions, they can be reduced to one, which takes place in different parts of a portion of the angular vein about an inch and an half long. This bleeding yields plenty of blood, because the vein is large; but it is not easy to feel it with one's finger, although it should be swelled, and accordingly there is often danger of cutting the flesh without drawing blood.

The veins of the temples cannot be compressed so as to swell them; for they are too small. In several breeds of sheep the temples are covered with wool; and it is difficult to draw blood in that part from those, that have horns. I got however several sheep of that kind bled in the temples, but the blood, instead of flowing, came out only in drops.

When blood is drawn from the ears, it is done by means of a wound, because the veins are so small, that many of them must be opened together. An incision is made in the ear, and then it is struck to make the blood come out; this is a bad process and should not be allowed but in very pressing cases, in which nothing better could be done. *

Bleeding in the jugular vein, in the fore-legs, and above the knees is too difficult for most shep-

* For the meagrim, turn, or giddy, I have cured great numbers by pulling the ears violently, and then cutting them off as close as possible to the head. (*Parkinson's Experienced Farmer*, 1798, Vol. I. p. 182)

herds,

herds, and one man alone could not easily perform the operation ; and besides, bleeding at the neck or fore-legs would spoil the wool.

There are two ways of drawing blood from the tail, the one from the part that has no wool, and the other from the extremity. The first of them gives but a small quantity of blood.

To draw blood from the end of the tail, one must at least cut the last false vertebra ; this operation cannot be performed with a lancet. In doing it, the veins and arteries together with the bone are cut ; the flesh shrinks back and leaves the bone uncovered, and there remains a wound,

Blood is drawn from different parts of sheep's feet ; but in these parts there are only small veins. Besides, it is to be feared, that the dirt, which often gets into the cicatrix, may cause an inflammation and a deposition, which not only lames the animal, but may reach to its heels ; there is also this inconvenience, that blood cannot be easily drawn from the foot by one man alone.

I have discovered another manner of bleeding sheep, which I think preferable to all the usual ones, because it is not subject to any of the inconveniencies, that I have mentioned, and because it is more easily performed. The blood is drawn from the low part of the cheek at the root of the fourth grinding tooth, which is the thickest of all, as its root is also the largest. The place,

place, where it is, is marked on the exterior coat of the bone of the upper jaw by a tubercle big enough to be felt with the finger, when one touches the skin of the cheek. This tubercle is a very sure index for finding the angular vein, that passes under it. This vein extends from the lowermost line of the under jaw near the angle of it, up to under the tubercle; farther on it curves and extends as far as the hollow between the eye-brows.

To draw blood in that part, the shepherd puts the lancet open between his teeth, then places the sheep between his legs, and holds it fast. He keeps his left knee a little more forward than the right. He puts his left hand under the animal's head, and holds fast the under jaw in such a manner, that his fingers touch the right branch of the jaw near its extremity, and compress the angular vein for the purpose of swelling it. With the other hand he touches the right cheek of the sheep at the part, which is nearly at an equal distance from the eye and mouth. He finds there the tubercle, that is to direct him; he can also feel the angular vein swelled under it. Then he takes the lancet with his right hand, and opens the vein with a cut upwards, of about half the breadth of a finger, below the middle of the tubercle.

I can say without exaggeration, that a blind man could draw blood from that part, because
he

he would feel with one of his fingers the tubercle, while he would be making the incision.

Bleeding at the cheek is therefore both safe and easy, because no mistake can be made as to the situation of the vein, and because it is large enough to afford a sufficient quantity of blood, as it receives that of the veins of the forehead, eyebrows, nose, and upper lip, &c. The blood is kept there by the shepherd's hand, which serves as a ligament at the angle of the jaw. There is no danger of cutting the artery; for I have always found a space between it and the vein, at the place, where the blood is drawn. This operation can be performed by one man alone.

All these advantages have induced me to prefer it, to the drawing blood elsewhere, after repeated comparative experiments.

THE SCAB.

I shall now point out a remedy for the scab, which is preferable to the usual ones.

The scab in sheep makes a continual progress; the longer it has lasted, the more difficult it is to be cured. The shepherd therefore ought to be very attentive in discovering the first symptoms of it. He must watch his flock carefully, to see if any of them scratch themselves with their feet or teeth, or if they rub themselves against the racks, trees, walls, &c. if the wool is soiled with mud
in

in those parts of the body, that a sheep can get at with its feet; if there are any locks of wool decomposed, which the sheep had dragged with its teeth or rubbed with its foot. These signs indicate an itching caused by vermin, the scab, or other diseases. The shepherd ought to inspect the sheep in those parts, where the wool is decomposed, to see whether there be any real symptoms of the scab.

The symptoms are these. The skin is harder in the scabby parts than elsewhere, and one feels certain grains under the finger. It is covered with white scales, as also with crusts or little lumps, which are at first red and inflamed, but afterwards become white or green. All these symptoms cause an itching; but there is another sort of scab, that does not itch at all; it spreads quickly under the wool, and the wool, instead of falling off, turns of a reddish colour and grows into lumps, as if it had been trodden upon.

When any of these symptoms are perceived, the remedy for the scab must be immediately applied. However, if there be reason to suppose, that the disease proceeds from fatigue or uncleanness, from bad air or from the heat of the stalls, from want of nourishment or from the bad quality of it, it is necessary to remove the cause of the disease, as otherwise it would obstruct the action of the remedy. If the scab is caused by any other sickness, they must be both cured at the same time.

time. When the scab is neither inveterate nor ulcerated, it can be cured by the application of external remedies alone, without using internal ones. A great number of such remedies has been applied, which it would be too tedious and to no purpose to adduce; I shall only mention the principal ones.

The most usual remedies are tobacco-water, cade-oil, the solution of green vitriol, of alum, or of common salt, the flour of sulphur, grey ointment, &c. All these remedies can cure the scab; but every one of them has its inconveniencies. Tobacco-water, cade-oil, and the solution of salts are hurtful to the skin in a scabby state; they increase and protract the thickening, the dryness, and the hardness of it, whereby the growth and the good condition of the wool are injured. Besides, the tobacco, and particularly cade-oil causes some red and blackish stains, which spoil the wool. The sulphur gives it a bad smell, that remains in the fleece after the shearing. The mercury of the grey ointment may cause a salivation both in the shepherds and the sheep, to stop which internal remedies should be used. Add to all this, that, as sheep are intended for slaughter, no remedies should be used, but such as cannot produce any bad effect.

Having tried all these remedies and several others on my sheep, I have found, that it was necessary to search for a better one, that would

be of little expence and easy of application, and which would not communicate any bad quality to the wool, or to the flesh of the animal. A mixture of fuet or greafe, with the essential oil of turpentine, answers all these purposes. Greafe is preferable to fuet in winter, because it can be spread more easily on the skin; but fuet is better in summer, because it does not melt as soon as the greafe. It is very easy to make up this remedy.

Take a pound of fuet, or greafe melted. When it is taken from the fire, mix it with a quarter of a pound of oil of turpentine. This ointment costs very little; it produces no bad effect on the wool; it softens the skin, that was hardened by the scab, and it cures the disease. It can be made more efficacious by augmenting the quantity of the oil of turpentine.

It is easy to use it, without cutting off the wool where the scab is, it being sufficient to set aside some of the locks so as to uncover the affected part. The shepherd then rubs the skin with the scratcher, merely for the purpose of taking off the scruff, and when this is done, he lays on the ointment with his finger.

There is a bad custom of rubbing the skins of scabby sheep with a piece of broken earthenware or of brick, so as make it bleed, whence there comes a small wound. I have given to my shepherds an instrument, which alone is sufficient

sufficient for the operations, that they have to perform upon sheep. It is a sort of knife, the point of which is two-edged and serves for a lancet; the handle terminates in a small plate of ivory or bone, which forms a scratcher.

Ellis, who is one of the best English authors, that have written on the management of sheep, has given several recipes for the scab, in which the oil of turpentine is mixed with beer, or with a decoction of tobacco, of soap, of urine, of brine &c. But I think, that the oil of turpentine has never been used in the manner I propose, and so suitably to every circumstance. I have been convinced of the efficacy of this ointment by long experience, and shall adduce only one of the most decisive proofs. Last winter a flock of rams and ewes was made to set out, without my knowledge, for my sheep-cote, in very bad circumstances. They had two hundred leagues to go; the ewes were big with lamb; the season was very severe and the ground covered with snow. As soon as I heard of it, I wrote to have them stopped. They were at that time fifty leagues distant from my sheep-cote; the ewes had yeaned on the road; the lambs and many of the ewes died; both rams and ewes had lost almost all their wool; they were extenuated and covered over with the scab. Notwithstanding all this, they have been perfectly cured with the ointment, which I have described. They are at present in a very good condition.

This flock is valuable for the excellent quality of its wool. I make use of it for my experiments on the melioration of wool. The good health of the ewes and particularly of the rams is absolutely necessary for this purpose, and on that account I have searched for the means of preserving it, and of re-establishing it when necessary.

In the year 1465 Edward IV. then king of England, having received some favours from the King of Spain, and willing to return the kindness, very imprudently sent him a present of some fine English sheep; these first caused the fine breed of sheep there, which have been so famous, and also the decay of the woollen manufacture here in England, the demand for exportation being considerably lessened: to recover which, Queen Elizabeth ordered the Lord Chancellor and Judges to sit upon wool-packs, in the parliament house, in order to remind them of the decay in that branch of business, and (wool being the staple commodity in this kingdom) of the necessity of using the utmost vigilance to recover and maintain it. (*Farmers Magazine*, Vol. 3. p. 238.)

Consequently the native sheep of Spain yielded wool improper for the manufacture.

The Spaniards then applied to Barbary, and by the mixture of that breed acquired the excellent
sheep,

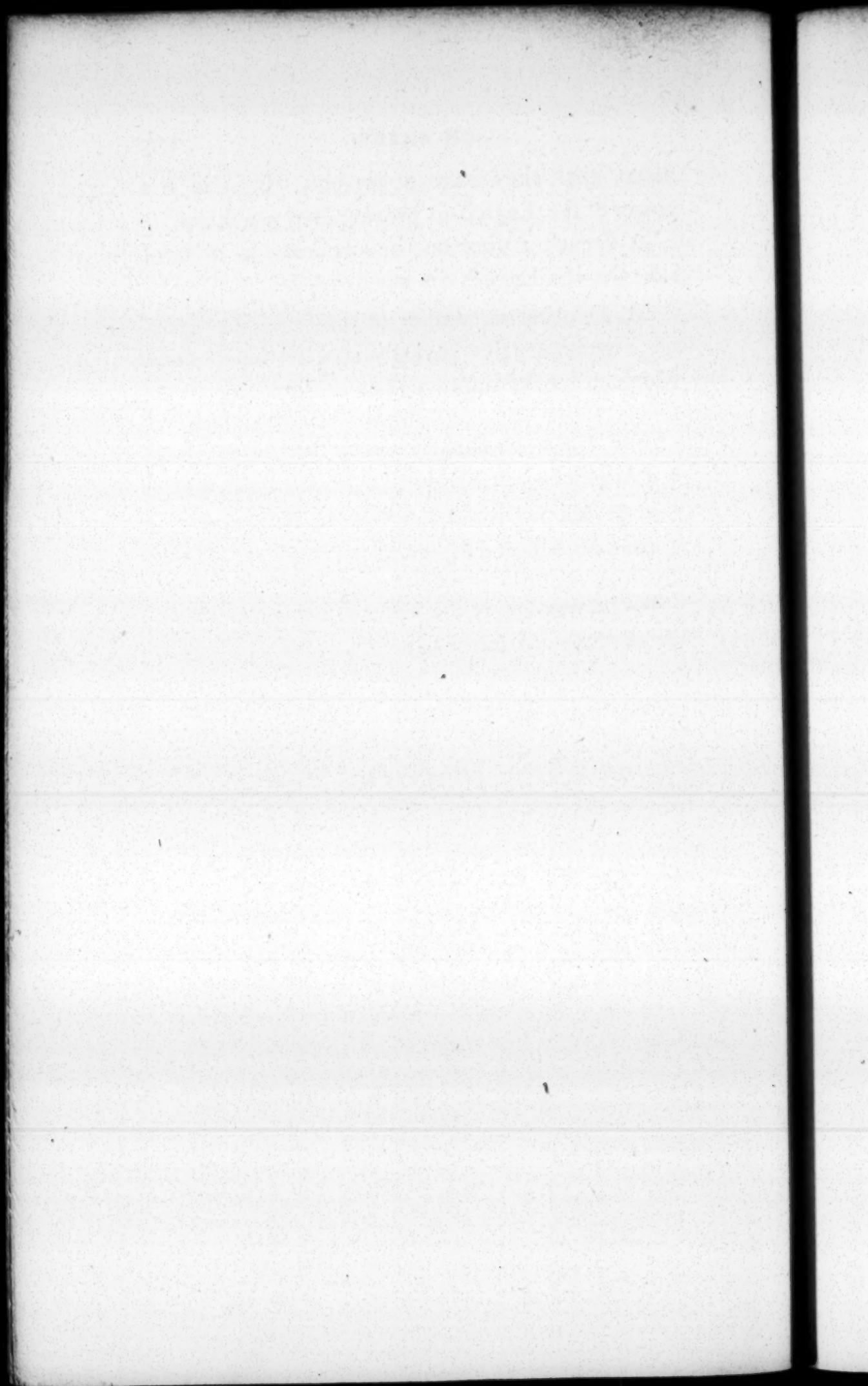
sheep, that they have at present. It is in the power of the English to procure Barbary sheep.

A French author on the amelioration of wool ridicules the English for not doing so.

M. Daubenton, author of the foregoing Treatise, mentions the having imported sheep from Morocco for the improvement of the wool.

“ On a amélioré au degré superfin des races
“ d’Angleterre, de Flandres, d’Auxais, de Rouffillon
“ et de Maroc, par des béliers de Rouffillon, sans
“ avoir des béliers d’Espagne.”

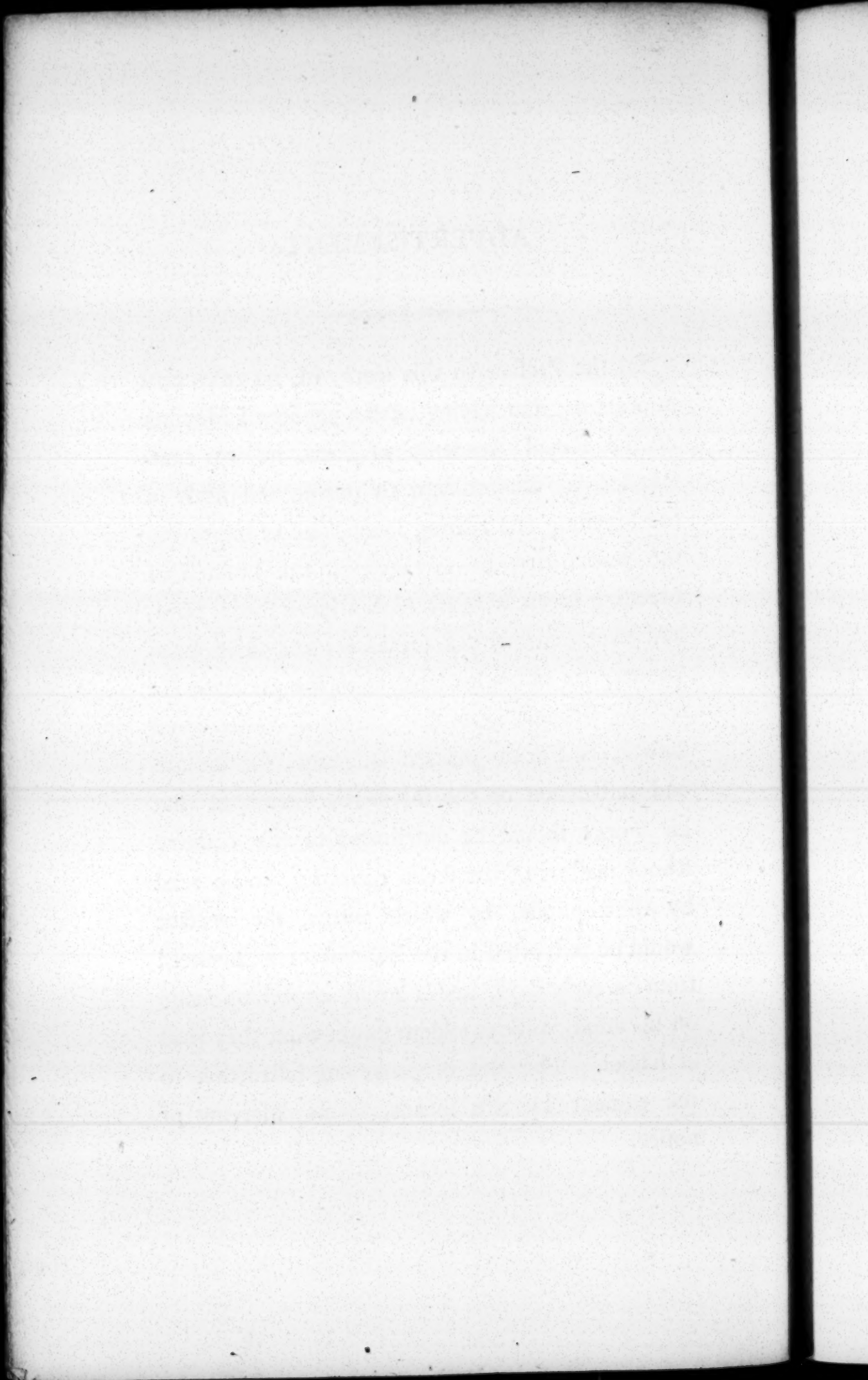
We propose to give the whole of Daubenton’s Treatise on Sheep at a future day.



ADVERTISEMENT.



IN the Preface to this work, M. DAUBENTON informs us, that having been a pensioned Member of the Royal Academy of Paris, he was commanded by Government to pursue the study of the breeding and rearing sheep, and of improving the wool; that he engaged in the business of breeding sheep himself, took a large sheep farm, and after fourteen years residence and strict observations, he offers his labours to the public.—He tells us, that his Treatise is written in question and answer, and in the plainest language, for the use and instruction of the shepherd, intending, that his works should be distributed to the country school masters of the sheep countries, to be read by their pupils, by which means, the peasant would be instructed in the business of a shepherd from his early days, and a lasting impression made on his mind, as boys seldom forget what they read at school. The idea of conveying instruction to the peasant by this means, seems deserving of notice.





A P L A N,
FOR THE INTRODUCTION AND ESTABLISHMENT
OF THE
MOST ADVANTAGEOUS MANAGEMENT OF
M I N E S
IN THE KINGDOM OF IRELAND.

—●●●●●—
BY RICHARD KIRWAN, ESQ.
—●●●●●—

“**T**HAT many valuable mines of lead, copper, and iron, (and probably also of zinc, manganese, and cobalt) exist in Ireland is too well known to require any proof. Mineral coal, a substance still more precious, is also found in many parts of this kingdom, and, if skilfully and diligently sought, might perhaps in many more; but it is equally known, that in the art of tracing them and in the skill of working them, this kingdom is miserably deficient, insomuch that an undertaking
20 of

of this nature is in most cases as hazardous as a game of chance. To exclude the dominion of chance in all cases is impossible; but to investigate and secure the probability of success in most cases, is certainly attainable. For this purpose we need only adopt the regulations, and imitate the modes of managing mines, that are successfully practised in Germany and Sweden, countries of which they form the chief wealth, and whence our own general laws of property were originally deduced.

“ The most essential of these general laws may be reduced to the following :

“ 1st. That no proprietor, discoverer or acquirer of a mine should be allowed to work it without the permission of the general Mining Board, which consists of senior and junior members, whose constitution and the qualifications of its members, will be presently mentioned.

“ 2d. That, when a mine is discovered, notice of it, and a sample of its contents should be sent to the Mining Board, with some general description of its situation, and the name of the proprietor.

“ 3d.

“ 3d. That within one month after the service of this notice the Board should send a junior member at the expence of the person, whose property the mine is, to examine its situation, and general appearances, whether a vein, or bed, its dip, direction &c. the proximity of combustibles, of wood, water, inhabitants &c. and make his report thereof to the Board within one month.

“ 4th. If the report be favourable, the Board to send a senior member to re-examine the particulars of the first report, and if the report made by the senior member be also favourable, the Board sends a certificate thereof to the proprietor *gratis*, and permits him to advertise it, to form a company to undertake its exploitation.

“ 5th. The expences of working the mine being thus provided for, either by the proprietor or by a company, notice thereof is given to the Board, and the sums, which it judges necessary to defray the first expences, being raised and deposited in bank, a junior member of the Board is appointed to conduct the exploitation of the mine, find the working miners, pay them out of the deposit,

buy the necessary tools &c. and be himself remunerated for his trouble by such share of the profit as shall be agreed upon, and present an account of the disbursements to the proprietors or a committee thereof every month, under the penalty of forfeiting his share and being displaced from the Board.

“ It is plain, that accommodations for the lodgement and support of the miners must previously be provided by the proprietors themselves under the direction of the junior member. But the expences of other erections or constructions are to be defrayed out of the deposited stock.

OF THE CONSTITUTION OF THE MINING BOARD.

“ The general Mining Board should consist of twelve persons well instructed in the mining art and habitually resident in Dublin, who should meet twice a week for the dispatch of business in some convenient place, furnished with a laboratory for assaying ores. Of the twelve members
four

four should have a salary of 500*l.* per annum : two of 400*l.* and six of 300*l.*

“ To qualify a candidate for admission to the Board, it is necessary that he should have a competent knowledge of the Latin and French languages, be well instructed in arithmetic, geometry, trigonometry, surveying, subterraneous geometry, drawing, mineralogy, chemistry, the art of assaying ores and working them in the great ; and two of them at least should be acquainted with the principles of statics, hydrostatics, hydraulics, and mechanics, so as to be able to direct the construction and analyse the powers of machines, and understand the formation of canals. Of these arts much may be learned at home, but to complete the education of the candidates it is necessary, that (for some years to come at least,) they should be instructed in mineralogy and mining at *Freyberg* for two years, that they should spend another year in travelling through various parts of Germany where mines are worked, as Bohemia, the Hartz &c. noting the practice in each, and another year in England, to note the practice of Cornwall, Derbyshire, Wales, Newcastle, Whitehaven &c. and be furnished with proper certificates of such attendance.

It

“ It cannot be expected, that these various attainments will be attended to, without a prospect of an adequate recompence.

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“ To prevent the admission of improper persons into the Mining Board, it will be necessary, that they should be examined in the mathematical branches by the provost and fellows of Trinity College Dublin, and in the chemical branches by the professors of chemistry at Trinity College and at the Dublin Society, and obtain certificates of their sufficiency, and as to mineralogy and the art of working ores in the great, that they should produce certificates as abovementioned, and undergo a general public examination before the Mining Board, and be elected or rejected by ballot.

“ For senior members of the first mining board I would recommend J. Hawkins Esq. of Cornwall, and Dr. Geo. Mitchel of Belfast now at Freyberg. These gentlemen may find among their German acquaintance the remaining necessary number, and in process of time the junior members could be advanced to the degree of senior members
upon

upon a vacancy, according to their rank of standing.

“ Every summer two or more of the members may be deputed to the different counties of the kingdom, to form a mineral survey of each.

“ Every European state have, within these last 20 years, sent persons for instruction to Germany at the publick expence, except England, where rich individuals have sent their sons at their own expence, as Mr. Boulton, Mr. Watt, Mr. Wedgwood, and many others.

“ We have not in the English language any work on subterraneous geometry, but Du Hamel and Jarrs have published some good tracts in French, and Kæstner (and many others) in German. These I possess, and they may be translated and thrown into one volume at a moderate expence.

“ If this plan be judged worthy of attention, a plan of mining jurisprudence, extracted from that of various German states, would be furnished.

“ It

“ It would also be proper, that Parliament should empower the grand juries of the different counties of the kingdom to raise a sum not exceeding 50 or 60*l.* for the purpose of fabricating a mine augre for exploring the mineral contents of each county, to be deposited with the treasurer, to be given to the different baronies according to the rank of their names in the alphabet.”

R. K.



MIS-

